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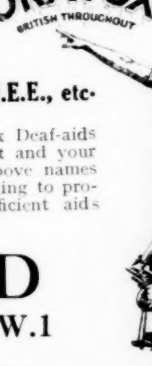

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An Address

ON

CANCER OF THE COLON.

Being the Annual Oration of the Medical Society of London, delivered on May 13th, 1929,

BY G. GREY TURNER, F.R.C.S. ENG.,

SURGEON TO THE ROYAL INFIRMARY, NEWCASTLE-UPON-TYNE; PROFESSOR OF SURGERY IN THE UNIVERSITY OF DURHAM.

(*Concluded from page 1023.*)

THE ACTUAL MANAGEMENT OF CASES.

I hope I have already clearly shown that in my experience cases do best, and make the easiest recovery, in which there has been a preliminary drainage of the large bowel, usually by opening the cæcum. The advantages of this preliminary cæcostomy are that:—

1. It relieves obstruction, whether acute, partial, or potential.

2. It relieves the recurring distension of the colon by gas, which is so apt to occur in cases where the function of the great bowel has for some time been interfered with.

3. It allows the bowel to recover from the effect of obstruction of any degree, both as regards infection and muscle tone.

4. It permits the great bowel to empty, not necessarily entirely through the cæcostomy, but by relieving the disturbed function and by allowing relaxation of its wall.

5. It permits of irrigation of the bowel, either from the anus to the cæcostomy, or vice versa.

6. It relieves pain and enables the patient to get natural sleep and to assimilate nourishment.

Many surgeons, recognising the advantages of drainage, have sought to extend it to cases without obstruction by combining a safety-valve cæcostomy with the one-stage operation of excision. This is a plan which I also have carried out from time to time, but I do not consider it nearly so satisfactory as the preliminary drainage. If the opening into the cæcum is going to be reliable, its function as a by-pass ought to be established, and unless there is considerable tension in the bowel this cannot be expected to occur at once. I know that an opening made at the time of the resection has often sufficed, but I do want to urge that when there is the least doubt, it is much wiser to make it some days earlier.

Even in the presence of obstruction, a cæcostomy is not always efficient. I do not imagine that it will ever fail to relieve the immediate symptoms of obstruction, but quite often the bowel does not completely empty, and does not recover its normal size and tone. In these circumstances the surgeon may find an enlarged fæcal soiled, sodden, and infected intestine, even some two or three weeks after the cæcum has been opened. For these reasons a preliminary colostomy is sometimes more valuable.

If a cæcostomy functions satisfactorily and relieves the mechanical symptoms and, in spite of this, the patient does not pick up, a search must be made for the cause. Either there is unsuspected dissemination which may be suggested by a slight degree of jaundice, or there are fæcal ulcers in the bowel with localised peritonitis, or there is absorption from a sloughing growth, or from an abscess in association with the growth. All these conditions, except dissemination, are indications for a further operation rather than for waiting. This brings us to the consideration of the proper interval that should elapse between the cæcostomy and the next stage.

This depends upon the progress which is made. As long as the patient is really improving, then it seems prudent to wait. If progress hesitates after the mechanical obstruction is relieved by satisfactory drainage, then it does not seem wiser to delay for longer than two weeks because the stabilisation of the fistula will have occurred by that time, and want of recovery will be due to one of the other conditions which have been mentioned, and which are not likely to improve by further waiting.

During this period irrigation of the bowel can be carried out from the rectum and through the cæcostomy, although the former is likely to be the more successful. If this is not immediately successful, it should be repeated, and it is quite extraordinary how on one occasion fluid passed into the rectum will find its way through what subsequently proves to be a tiny channel in the growth, while on another occasion nothing can be made to traverse the intestinal canal. It does not appear that antiseptic irrigation is any more useful than irrigation by saline solution, which acts purely mechanically. It is important to give at least one dose of purgative medicine to make sure that the small bowel is thoroughly emptied, but repeated purgation in the presence of a patent cæcostomy seems to have no effect on the large bowel and is unnecessary.

The interval between the cæcostomy and the second operation should be used for endeavouring to locate the exact situation of the growth. Where this can be done it is possible that exposure to X rays or to radium emanation may be valuable, but these are methods which I have not employed, and they only occur to me as refinements which may become the established practice in the not very distant future.

A difficult class of case is the patient who arrives with a mild degree of obstruction. The symptoms are not very marked and the abdomen is not distended; in other words, there is nothing to determine that only a blind cæcostomy should be carried out. In these circumstances the best results will follow if the surgeon will open the abdomen and determine the situation and extent of the growth, with a view to its subsequent removal. Having made this investigation and determined that resection is likely to be feasible, he should do a preliminary cæcostomy or colostomy and remove the growth at a subsequent operation. If, on the other hand, the growth is clearly irremovable, or is on the borderline, then it may be wise to make a lateral anastomosis which will suffice to relieve the condition as far as possible. Sometimes I have made such an anastomosis with the intention that if the patient made an extremely good immediate recovery, then I would reopen the abdomen by direct incision over the growth, and endeavour to remove it. Such efforts have not infrequently been rewarded, and I want to refer you to a growth in the neighbourhood of the splenic flexure which, at such an operation, I found to be involving the upper jejunum, together with a portion of the stomach.

At the first operation a lateral anastomosis was made between the proximal colon and the sigmoid. During the fortnight that followed the patient made such unexpectedly good progress that I reopened the abdomen and excised the mass of growth, together with the loop of jejunum and a complete section of the stomach (Fig. 4). The patient is now, more than two years afterwards, in excellent health, having gained 2 st. in weight, and is able to follow his occupation regularly.

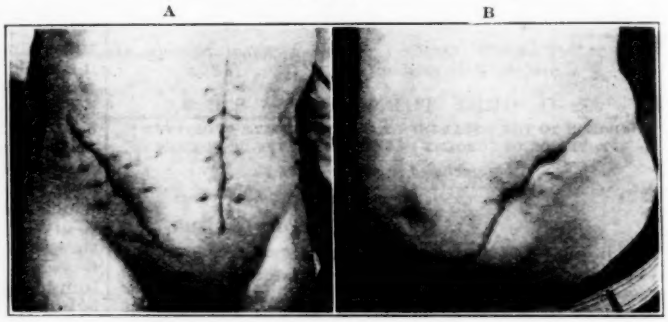
This seems a proper place to indicate the sort of preliminary investigation that must be made when the abdomen is opened. It includes first an examination of the liver for secondary deposits, and if these are absolutely definite, then I scarcely think that it is ever worth while to do more than a palliative anastomosis. At the same time I would not be easily deterred, for sometimes a simple mass in the liver may simulate a secondary deposit, and subsequent investigation, or the future history of the patient, has more than once shown that such a single mass has been an adenoma, an angioma, or an old inflammatory condition. I should much rather do what may prove to be an unnecessary resection than deny a single patient the great advantages of the removal of a malignant growth because of the fear that some indefinite lump in the liver may after all turn out to be a secondary deposit.

It is next important to examine carefully the neighbourhood of the growth for such extension as might render a radical operation unwise; especially the presence of secondary outlying nodules on the peritoneum—one of the worst of all types of dissemination.

The glands in the neighbourhood of the growth should then be carefully examined. Masses of glands close up to the growth need not be a deterrent, but a chain of glands extending far from the growth, though they need not prevent a resection being carried out, are certainly of evil omen. Sometimes a single mass of glands may be found at some distance from the growth. Under these circumstances the growth may safely be removed, and an anastomosis made, and the glands dealt with either then or subsequently by the insertion of radium. I see that my friend Mr. Clogg, confronted with such an eventuality, operated a second time and removed the glands, but this opportunity cannot often arise.

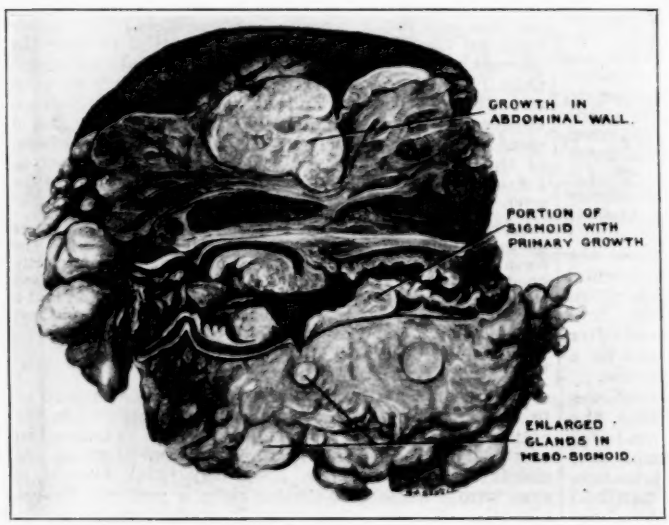
Cases in which the growth is adherent to the abdominal wall are sometimes unpromising, but such an invasion need not prevent successful removal, and I want to bring before your notice two patients in which this infiltration was of very great extent. Minor degrees of fixation to the muscles of the abdominal parietes are not infrequent, and can usually easily be dealt with, but in the patients that I have in mind the whole thickness of the abdominal wall was infiltrated, so that in both the growth made a very definite and obvious mass on the surface. In both I was able to excise the involved area of the abdominal wall, and to make a satisfactory excision of the adherent bowel. In the first case, Fig. 2, where a portion of small intestine had also to be removed, the patient is alive and free from recurrence now nine years after operation, and in the second, Figs. 5B and 6, the patient is extremely well, though more than four years have elapsed since the operation was carried out.

FIG. 5.



To show the oblique muscle-cutting incisions employed for dealing with adherent growths. In A the growth was at the hepatic flexure. It could not be successfully mobilised from the median incision. Through the oblique incision the cæcum with an open cæcostomy and the growth were easily removed. In B the growth was in the sigmoid and had invaded a considerable area of the whole thickness of the abdominal wall. This was removed with the growth and an end-to-end union established. The specimen is shown in Fig. 6. The patient, a man of 64, is alive and well nearly five years afterwards.

FIG. 6.



The specimen referred to in Fig. 5B. (Case 11 in list of multiple resections.)

THE INCISION.

Having determined, by the preoperative examination, or by preliminary exploration, the situation of the growth, the selection of the optimum incision is a matter of great importance. Mobile growths in a mobile colon may be easily removed through a median or paramedian incision, but very adherent growths in the cæcal region, the hepatic or splenic flexure, or the descending colon or commencement of the sigmoid cannot be satisfactorily dealt with by this route. It is to meet these circumstances that I strongly advocate direct exposure over the situation of the growth, using the oblique or transverse muscle-cutting incisions of Rutherford Morison (Fig. 5).

If the surgeon first makes a median incision and finds that a growth favourable for removal because of the absence of dissemination is yet so fixed as to be inaccessible, he must not hesitate to make a second independent incision over the growth or he must make a cross-cut from his original one (Fig. 7A).

MOBILISATION.

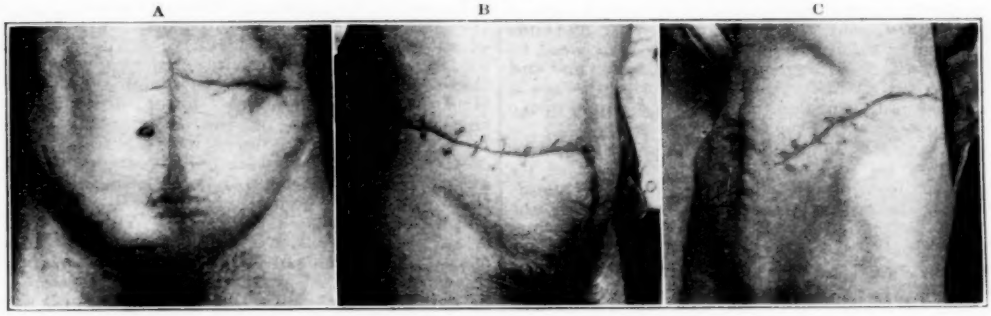
Fixation of the growth, in the great majority of cases, is not due to malignant infiltration, but to an exaggeration of the fixation of those parts of the large bowel which has been so frequently described in the literature that has sprung up around the subject of intestinal stasis. The sort of adhesions which are responsible for the first and last kinks of Sir William Arbuthnot Lane may be congenital or they may be inflammatory, but in either case, in the presence of some localised lesion, like a bowel growth, they become much more definite and are sufficient to produce such a degree of fixation as to lead to the impression that such want of mobility is due to extension of the malignant growth. It is very rarely that the fixation to which I now refer cannot be dealt with by local interference, but unless the scissors can be freely used under the guidance of the eye it may be very baffling. It is for this reason that I consider that the operability of quite a proportion of the growths which we are now considering depends on the access which the parietal incision allows, and this is why I so strongly advocate an approach directly over the growth, rather than the traditional incision in the neighbourhood of the middle line.

The kind of fixation which is due to extension of the growth to neighbouring parts by contiguity, if it occurs on the mesenteric side, may well debar

successful removal, but fortuitously it often arises away from the mesentery, and in these circumstances the extensions of the growth can often be successfully removed. I have many times cut away portions of the parietes, or an area of the peritoneum, transversalis fascia, or iliac fasciæ, or sometimes a complete section of the abdominal wall (Fig. 5B). As is shown in the list of cases of multiple excisions this sort of extension has sometimes meant the sacrifice of some part of the other viscera, and I have several times, for this reason, removed the appendages or the uterus in the female, a portion of the bladder; or a loop of small intestine; and twice a complete section of the stomach. Sometimes a slice of the stomach or duodenum, or a part of the margin of the liver has sufficed. Some of my patients who have been subjected to these extensive operations are alive and in good health several years after the operation (Fig. 8).

Separation of adhesions and the measures necessary for dealing with such extensions as I have described may mean that the mobilisation is itself a formidable matter, and I would urge the need of taking care to deal with the hæmorrhage that may occur, for I have certainly once lost a patient as the result of hæmorrhage, and possibly on other occasions such bleeding may have contributed to an unfortunate result.

FIG. 7.



A shows the incisions employed for the removal of an adherent growth of the splenic flexure. To enable mobilisation to be carried out the cross cut through the rectus had to be employed. The patient was operated upon by Paul's method and is alive and well ten years afterwards. B shows the incision used for the removal of an adherent growth of the ascending colon with many glands. The bowel from the lower ileum to the middle of the transverse colon was excised. C shows a similar incision employed for an adherent growth of the descending colon. An exploration was previously carried out through the median incision. Both B and C are recent cases.

CONDUCT OF THE RESECTION.

The actual operation of excision of a portion of the colon is seldom like the pictures one sees in works on surgery. I do not wish to say anything disparaging about the many beautiful and sometimes excellent illustrations that appear in text-books, but I do want to emphasise the very great difficulty of correctly depicting abdominal surgical procedures. I speak feelingly on this matter, because I have tried very hard to represent exactly and accurately what actually occurs, but it is extraordinarily difficult. In most books the clamps figure much too largely. I do not understand the necessity for crushing the ends of the bowel, and for my own part I am content to use clamps which merely temporarily occlude the bowel until the suturing of the ends is carefully carried out. Nor do I understand the wisdom of dividing the bowel with the cautery. No surgeon would elect to cut the bowel so near the growth as to make the use of the cautery necessary for the destruction of malignant tissue in the cut margin, but I do think that the cautery is valuable in these operations. Its usefulness is in the division of the mesentery in the neighbourhood of the lymphatics, or in those situations where the surgeon has not been able to get very far away from what is possibly an infected gland for the application of his ligatures. Under these circumstances the use of the cautery seems rational.

I have no confidence in those operations which have been proposed for the carrying out of so-called aseptic intestinal anastomosis. I have little fear of septic contamination from the contents of the bowel or its mucous surface, and I feel that if my cases have not done well it has not been because septic contamination has occurred at the time of operation. As a rule, if an anastomosis has failed there has been some fault connected with the blood-supply, or the patient has suffered from sepsis that has arisen from the sodden infected condition of the bowel and not from the exposed cut surface at the operation itself. I am at liberty to mention that Prof. John Fraser, of Edinburgh, who, with Mr. Norman Dott, was responsible for the introduction of an ingenious guillotine method of aseptic anastomosis, has himself largely given up the plan because he has found that, in the human subject at all events, it has not proved sufficiently successful.

The question often arises as to whether the anastomosis should be made by the end-to-end or the side-to-side method. This is a matter which may be safely left in the hands of the experienced surgeon, but others may welcome some guidance. Personally, I was brought up to rely on the lateral method, but I have been gradually converted to the end-to-end plan, and for the following reasons: the latter requires much less bowel, so that in a case in which it may be forseen that it will be difficult to get the ends together, more bowel can be sacrificed without jeopardising the success of the union than could be taken away if enough had to be left to make a satisfactory side-to-side anastomosis. There is much less suturing to carry out, and much less suturing to go wrong. There are no blind ends; blind ends which I have twice seen give way, and lead to a fæcal fistula, one of which required a secondary operation, and which I have no doubt on other occasions have leaked with more disastrous consequences. The end-to-end method is quicker, and this is of some moment, because it means that more time can be spent on the more important step of free mobilisation. Further, there is no temptation to scamp the suture line, and, lastly, the end-to-end union is certainly the more natural. But one freely admits that one method will not necessarily fulfil all the multitudinous indications that may arise. The surgeon should be conservative in his tastes but catholic in his methods, and should be prepared at all times to adopt any particular method that may fulfil a special indication.

This matter is often dismissed by saying that the operative measures are now sufficiently standardised. Since neither the human body nor pathological processes are standardised, I am fearful of "standardised operations." However much it may be desirable to follow some preconceived plan, the conditions

found on opening the abdomen may quite preclude the possibility. In this connexion I would point out that in many of the successful cases in my series it was not possible to carry out the removal of such an amount of bowel or mesentery as would bring the operation within the accepted text-book descriptions. If the cases which I have related have convinced any of you that a lesser operation will sometimes suffice it will be some satisfaction to me.

In making the anastomosis the following are the principles which have guided me.

It must be possible to approximate the bowel ends without the least tension, and they must be able to lie in comfortable proximity before any sutures are used. The blood-supply of every part of the circumference of the cut ends must be assured. The margins of the bowel ends must be plainly seen. A watertight junction must first be secured by through-and-through sutures, which must also arrest hæmorrhage. The first line of sutures must be buried by a peritoneal stitch which does not strangulate any of the visible blood-vessels. The line of union must be reinforced by suturing over it any of the neighbouring appendices epiploicæ or other available tissue.

I am frightened of any method which aims at simplifying the anastomosis at the expense of any of these principles, and am suspicious of all methods which savour of sleight of hand. There is no need to hurry so important a matter, and it demands time and care for its satisfactory completion. Clamps are a convenience, not a necessity, and they must never be so strong as to crush the bowel wall.

The exact site at which it is safe to make the anastomosis must be judged by a consideration of its anatomy, its proximity to the growth, and the blood-supply. So far as the latter is concerned, I am not content to be guided by any preconceived notions as to what the blood-supply ought to be in any particular segment of the large bowel, but I make it a practice to determine by inspection and by palpation, if necessary after the clamps are loosened, that there is a sufficient blood-supply right up to the cut margin. I would like to say once again that I feel satisfied that failures to unite are usually due to starvation of the edge, caused by insufficient blood-supply, and are not entirely dependent upon infection.

Provision for Drainage from the Site of the Anastomosis.

When the growth has been large, having a big, raw area as its bed, or has been associated with recent inflammatory disturbance, as shown by surrounding œdema, or when there is any question about the integrity of the blood-supply or the adequacy of the suturing, then will the surgeon be wise to bring a rubber strand or softened drainage-tube from the neighbourhood by the shortest route to the surface. Many times such a drain has saved a disaster for small fæcal leaks have sometimes occurred after great care has been expended at the operation. In every case such leaks have healed spontaneously.

Some Special Difficulties.

Though most difficulties disappear with adequate exposure and mobilisation, others are due to the obesity of the subject or the situation of the growth. When there is a great deal of fat surrounding the colon the difficulties are anatomical rather than pathological, but they may prove extreme. In such cases I find it helpful to divide the layers of the mesentery, so that the vessels may be clearly seen before they are caught or surrounded by ligature. If this step is not taken they have an unhappy knack of retracting amongst the slippery fat where they are difficult to catch, and where they quickly form large hæmatomas. It is also often difficult to catch up the bowel wall for the purpose of suturing, and it is wise to separate the fat from the line of section, so that the bowel wall is clearly seen and can be safely sutured. The tags of fat which have been left are invaluable as a means of providing a local covering when used in the form of a series of grafts over the suture line.

Low sigmoid growths are very troublesome, and the surgeon has often difficulty in deciding whether or not it is wise to remove the growth and, having done so, whether to leave the patient with a permanent colotomy or attempt to make an anastomosis. I would at once say that in these cases I never contemplate an immediate anastomosis unless the patient has the advantage of a previous cæcostomy or colostomy, but with that advantage it is possible every now and again to make a successful union, although the suturing has to be done almost flush with the pelvic floor. To facilitate the removal I have found that it is best to incise the pelvic peritoneum all round half an inch away from the bowel, and by blunt stripping to separate the fat while the bowel is gently drawn upon, so that what is really a portion of the rectum is pulled up into the peritoneal cavity. A clamp is applied to the latter or it is divided without clamps, and drawn up by catch forceps, so that the sutures may be applied. After the latter have been tied, the rectum, with the suture line, retracts into the cellular tissue of the pelvis. The peritoneum, which has been previously separated, then naturally falls into position around the bowel, and can be attached by a few points of suture at a higher level than the anastomosis, in that way providing an efficient protection. In these circumstances the peritoneum must not be closely sutured around the bowel, and a drain from the neighbourhood of the anastomosis must be brought up through the parietal incision. In many of these cases, instead of endeavouring to make an anastomosis at the time that the growth is removed, the lower end of the bowel is tucked in, and the upper end brought out as a colotomy. Whichever method is adopted a large, well-oiled rubber tube must be passed from the anus into the rectum, and kept there for some days. Even when the section has to be made so close below the growth that no bowel is available for an anastomosis, the outlook is not necessarily hopeless, and I have several patients alive and well after long periods in whom these conditions have pertained.

On three occasions I have subsequently restored the continuity of the bowel by a method which is referred to by Kelly in his book on "Operative Gynæcology." The intussusception method of Rutherford Morison was devised for this class of case. It is an operation which is highly ingenious in its conception, but in actual practice I have found it difficult and uncertain and very disappointing in its results, and though it may occasionally be used it has no wide field of application.

Peritonitis and Abscesses as Complications of Growths of the Bowel.

Every now and again the surgeon is confronted with a case in which a bowel growth has suddenly leaked into the peritoneum and the patient has to be operated upon as an emergency. Under these circumstances the condition is sufficiently desperate, but it need not necessarily be hopeless. In this series cases of the kind have been met with and some have been successfully overcome. Sometimes the growth has been withdrawn from the abdomen and left outside while the peritoneum and the bowel have both been drained. In others the hole in the growth has been patched by stitching omentum over it, or by stitching it to a neighbouring viscus. Or the leaking area has been brought directly to the surface through a suitable incision, and in all of these cases cæcostomy or colostomy has been performed and the peritoneum drained. In one such case a ruptured fæcal ulcer in the cæcum was used to make an anastomosis to the descending colon, the patient surviving for a sufficient length of time to justify this makeshift.

Sometimes there is peritonitis, which has arisen as a result of an infection through the wall of a growth

but without an actual rupture. In these cases drainage of the peritoneum and of the bowel have similarly tided the patients over the emergency, and secondary resection operations have been successfully carried out. In fact, in these cases I believe that the patients are peculiarly resistent and will tolerate an amount of subsequent interference which in other circumstances might be ill-borne.

A definite localised abscess round a growth is another complication which occasionally first draws attention to the presence of a bowel growth, and years ago I recorded two cases (*Edinburgh Medical Journal*, December, 1909), and since that time have come across other instances—seven in all. In dealing with this complication it is probably wisest first to drain the abscess, and at a second stage to deal with the growth. I say this with some heart-searching, because I have once or twice made the mistake of carrying out the complete operation at one sitting, when I feel that had the two-stage operation been adopted the patient could quite safely have been tided over the ordeal.

Doubtless many further improvements will be brought about in the treatment of these cases. At the time of the discussion in these rooms in 1920 nearly all the speakers bore witness to the enormous benefit which had followed the practice of not attempting the radical operation in the presence of obstruction, and of the recognition of the extreme importance of thorough mobilisation of the growth. Since then these principles have been more generally acted upon and with surprising improvement in the results. I can now only suggest that more care in the preparation of the patient along the lines suggested by Lord Moynihan, and very lucidly brought before the profession in his Harveian Oration of 1926, should be the rule. One wonders if perhaps by subjecting the growth to X rays or, in certain selected cases by the use of radium, the field of operability could be still further enlarged. These are matters which are as yet not settled, and it will perchance fall to the lot of some other orator to bring the result of experience along these lines before you. One thing I do indeed wonder with regard to malignant disease, and that is, whether we do not sometimes disseminate a comparatively innocuous growth by the manipulations which are necessary for its removal. This is suggested by the long history which sometimes precedes operative interference, and the relatively early recurrence dissemination which may follow it.

FIG. 8A.

A sigmoid growth densely adherent in the left iliac fossa and involving the parietes extensively. It was exposed and removed by an oblique muscle-cutting incision directly over it. Fig. 8B shows the growth in section. The patient is alive and well five years later.

FIG. 8B.

Same case as Fig. 8A. Shows the growth in section.

I am glad to have this opportunity of thanking those numerous medical friends who have so kindly helped me to keep in touch with their patients. I am sure that my recurring requests must often have proved a great annoyance.

In concluding this review of so important a subject, I realise acutely how very much has been left undone. A busy surgeon, with ever-increasing hospital duties and teaching responsibilities, is hard set to find the time to make use of the abundant material which passes through his hands. The coöperation of those less insistently occupied and more closely in touch with the resources of a pathological department is essential, and as I have preserved a great many of my specimens, I hope at some future time to add the result of an extended microscopical investigation in relation to the clinical results. Meanwhile, in extenuation of my manifold shortcomings, let me shelter behind these comforting words of Pope:—

> "Whoever thinks a faultless piece to see,
> Thinks what ne'er was, nor is, nor e'er shall be."

EXPERIMENTAL TREATMENT OF CANCER WITH TUBERCULIN.*

BY RAYMOND PEARL; ALAN C. SUTTON, M.D.; AND W. T. HOWARD, JR., M.D.

IN a paper by Pearl[1] on the relation between cancer and tuberculosis the following statement was made :—

"After this paper had been accepted for publication on June 11th, 1928, I asked Alan C. Sutton, M.D., a member of the staff of this Institute, and that of the Johns Hopkins Hospital, to undertake during the summer the preliminary organisation of experimental work on the treatment with living tubercle bacilli and tuberculin, of transplantable cancer in rats. In the discussion of these experiments it was decided that it would be highly desirable to see what would be the result of specially treating malignant tumours in human beings with some form of tuberculin when suitable cases for such treatment could be obtained, in view of the obvious deductions which logically follow from the results of the present study of autopsy material. The ideal case for a trial would be one in which, first, a carcinoma or a sarcoma had been removed surgically, and the malignant character of the tumour definitely proved from sections of the surgical specimen; in which, second, there has been at some later date an extensive, inoperable recurrence of the same tumour, confirmed by biopsy. If in such a case the tumour retrogressed or disappeared, following special tuberculin treatment alone, the evidence would have real significance.

"A small number of carefully selected cases of malignancy are now being treated by Dr. Sutton, under the direction and in consultation with the writer. Treatment of the first case began on July 10th, 1928."

It now seems desirable to report very briefly, and in an entirely preliminary way, on the progress to date of the work which we have done in treating cases of malignant disease in human beings with tuberculin. This preliminary statement will be followed in due course by a complete report presenting all the histopathological, clinical, and therapeutic data.

In the beginning stages of the trial of a new therapeutic agent for the treatment of cancer it was felt that it would be morally unjustifiable to accept for treatment any other than terminal stages of the disease, where any and all other methods of treatment had been abandoned as hopeless. Consequently all of the cases so far treated have been of this character, except one which came under treatment through unexpected circumstances in an early stage of the disease. It is our purpose to report briefly here only upon the cases which have been under treatment and study a sufficiently long time to give some reliable indication of the effect of the tuberculin therapy.

Clinical Histories.

CASE P 1.—Female, aged 52. Radical removal of left breast, May 18th, 1922. Adenocarcinoma. Partial excision of left supraclavicular lymph gland Sept. 21st, 1927. Metastatic carcinoma. X ray of chest at this time showed areas of consolidation in lower portion of right lung. Examination on July 1st, 1928, showed extensive recurrence in supraclavicular glands and extension of lung involvement. *Condition at beginning of treatment:* Patient bedridden, cyanotic, dyspnœic, with frequent attacks of severe coughing, during which the head and neck were engorged with blood, leaving her completely exhausted. Obstruction of pylorus, with 24-hour retention and daily vomiting. Her condition was rapidly and progressively getting worse. *Treatment:* Begun on July 10th, 1928, with B.F. tuberculin (bouillon filtré Denys). It has continued to the present time (April 1st, 1929). On account of the marked improvement in the patient's clinical condition, and because of the marked reduction in the size of metastatic supraclavicular glands, there was removed, surgically, a piece of one of these glands on Jan. 15th, 1929. Sections show a marked alteration as compared with material before treatment, chiefly characterised by extensive fibrosis, and œdema of residual cancer cells. *Present condition:* Patient is greatly improved. There is very little shortness of breath and that only on exertion. No cyanosis. There are only occasional mild attacks of coughing. She leads a life of moderate activity. Goes to theatre, luncheons, and climbs stairs and walks eight to ten blocks without much discomfort. Vomits only occasionally when mentally depressed, but there is no evidence of retention. Weight is constant at around 160 lb. X ray shows right lung practically clear.

CASE P 2.—Male, aged 57. Resection of pyloric end of stomach Jan. 10th, 1928. Carcinoma. On June 1st, 1928, noticed small lump in body wall wound, which continued to increase in size until on Oct. 16th, 1928, it measured 9 cm. in diameter. Its shape was that of an inverted half grape fruit. A smaller separate nodule in the lower portion of the wound measured 3 cm. in diameter. Metastatic gland in both axillæ. *Condition at beginning of treatment:* Patient emaciated and anæmic. Unable to work. *Treatment:* With B.F. tuberculin begun Oct. 17th, 1928, and has continued to the present time (April 1st, 1929). As the treatment progressed the tumour mass got progressively softer. On Feb. 1st, 1929, it began to slough over upper pole, and to drain from a central sinus. The character of this discharge indicated that hemorrhagic degeneration of the tumour mass was in progress. Because the large metastatic gland in the right axilla was apparently undergoing similar degeneration it was surgically removed on Feb. 19th, 1929. Sections show extensive œdema and vacuolation of the residual cancer cells, and congestion, hæmorrhage, œdema, and fibrosis of the stroma. Since the sloughing and drainage of the main tumour mass it has greatly diminished in size and improved in appearance. Normal epithelium has grown in over the cancerous tissue at the central drainage point and over the superficial ulcerated area at the upper pole. Unfortunately, while the central tumour was draining there was an extensive hæmorrhage one night which stopped itself, but left the patient very anæmic. *Present condition:* Tumour is approximately one-third of its maximum size. There is no evidence of new involvement. The chief concern now is the extreme anæmia following the severe hæmorrhage. This is at present improving, however, and there is now no bleeding at any point. Our impression is that the treatment was pushed too rapidly in its early stages, with a consequent too rapid disintegration of the tumour mass.

CASE P 3.—Female, aged 62. Radical removal of left breast Jan. 2nd, 1928. Adenocarcinoma. Radical dissection of metastatic left supraclavicular glands, Oct. 2nd, 1928. Partial excision of metastatic brain tumour Nov. 9th, 1928. This last operation was undertaken for the purpose of giving an opportunity to try tuberculin treatment, because the metastatic growths were rapidly progressing, and it was felt that unless a temporary stay could be obtained the patient would die from the brain metastasis before a fair trial of the tuberculin could be had. *Condition at beginning of treatment:* General condition good as to weight and blood picture. *Treatment:* With B.F. tuberculin began Oct. 30th, 1928, and has continued to the present time. *Present condition:* General nutrition still good and blood picture shows no particular change. Recently there has been gradual reappearance of brain symptoms, possibly due to pressure from œdematous reaction of residual tumour tissue following each treatment. With this thought in mind tuberculin is now being temporarily discontinued, to see whether relief of pressure symptoms will follow.

CASE P 4.—Female, aged 35. Radical amputation left breast with pectoral muscles and axillary glands, Dec. 8th, 1926. Many metastases in left axilla, especially along vessels. Medullary carcinoma. Second operation Feb. 28th, 1927, and metastatic deep cervical glands removed from left posterior cervical triangle. No tissue saved for pathological examination, or if saved was lost. On Feb. 9th, 1928, several small metastatic glands were discovered above the left clavicle. She was given courses in X ray treatment until Nov. 9th, 1928, when this therapy was discontinued because it was thought to be having a deleterious effect upon the blood picture. *Condition at beginning of treatment:* General condition excellent. Bothered only by slight cough. *Treatment:* With B.F. tuberculin begun on Nov. 16th, 1928, and continued till death. This patient exhibited a very low degreee of sensitivity to tuberculin, and did not show the usual reactions following therapeutic injections. On this account the dosage was rapidly pushed up so that by Dec. 10th she was receiving 1·0 c.cm. full strength B.F. tuberculin, which was raised on Dec. 22nd to 1·5 c.cm. This was followed by a rather severe general reaction with slight elevation of temperature. From this time on, though there was no apparent reaction to increased dosage of tuberculin, the patient complained of weakness, increased cough, and substernal pressure. On Jan. 6th, 1929, she developed a right side hydrothorax. On Jan. 11th the patient died. A partial autopsy revealed a malignant pericarditis and a non-malignant polyserositis involving both pleura and peritoneum. Sections of tissue

* Preliminary Report from the Institute for Biological Research of the Johns Hopkins University, Baltimore, U.S.A.

[1] Pearl, R.: Cancer and Tuberculosis, Amer. Jour. Hyg., 1929, ix., 97.

removed at autopsy showed remarkable and extensive changes in the cancer cells, particularly marked œdema of the cell body, much vacuolation, and shrinkage and degeneration of the nuclei. In view of the history it is impossible to prove that the marked alteration of the cancerous tissue observed at autopsy was solely due to the tuberculin treatment. It may have been the result of the X ray treatment, though the fact that the pericardial involvement showed the same changes perhaps makes this latter hypothesis somewhat improbable. Our general impression regarding this case, which is, however, incapable of proof, is that the dosage of tuberculin was pushed too rapidly, and brought about, on the one hand, too rapid degenerative alterations in the tumour tissue wherever located, and induced a condition of protein shock on the other hand. The unfortunate outcome led us to modify the general plan of treatment in all the cases, in the direction of not pushing the tuberculin dosage too rapidly.

CASE P 5.—Male, aged 38. Admitted to hospital Nov. 12th, 1928. Diagnosis (without operation or biopsy) inoperable carcinoma of rectum, with probable metastases to liver and retroperitoneal lymph glands. Secondary anæmia. Jaundice. *Condition at beginning of treatment:* General nutrition poor, had lost weight (weight = 135 lb.), marked secondary anæmia (red blood corpuscles, 2,100,000, hæmoglobin, 38 per cent.) Unable to work. *Treatment:* With B.F. tuberculin began Nov. 15th, 1928. Continued until Dec. 15th. At that time the patient felt so much better that he determined to leave the hospital and go to New Jersey for the Christmas holidays. This he did. On Dec. 28th he returned and treatment was begun again. Before leaving the hospital his blood had been built up by transfusion, but while absent he had bled profusely and became again very anæmic. Tuberculin treatment was continued until Jan. 30th, 1929. No further transfusion was given, though indicated, because he had no money to pay for it, and the hospital refused it without payment. On Feb. 1st, 1929, he was discharged from the hospital, without notice to either of the authors of this paper, because he refused a colostomy, which was advised by the hospital staff on the ground that complete occlusion of the bowel was impending. He received no further treatment. *Present condition:* On March, 20th, 1929, the patient unexpectedly turned up at the dispensary for the purpose of informing anyone interested that he was feeling well. On March 22nd his R.B.C. = 3,460,000 and Hb. = 45 per cent. He had been steadily gaining weight. On April 4th his weight was 155 lb., or 20 lb. more than on admission. Is strong. Has no bleeding. Proctoscopic examination of the rectal tumour shows now a considerable opening through it. There is no evidence of ulceration and the tumour mass is distinctly smaller than at the beginning of treatment. The jaundice disappeared shortly after treatment was begun and has never returned.

CASE P 6. Male, aged 66. In December, 1927, patient began to have attacks of gas with nausea and vomiting. From this time to May 6th, 1928, lost 25 lb. in weight. At operation, May 6th, 1928, was found to have inoperable carcinoma of stomach, so extensive that there was not enough normal stomach wall to permit any kind of anastomosis. Metastatic gland removed at operation showed adenocarcinoma. *Condition at beginning of treatment:* Emaciated, marked secondary anæmia, daily vomiting. *Treatment:* With B.F. tuberculin started Nov. 27th, 1928, and has continued to present time. Has had no other treatment. During first month of treatment did not feel so well. Thereafter marked improvement noted in stomach symptoms. Vomiting and pain practically entirely stopped. *Present condition:* Weight has stayed practically constant at around 145 lb. since beginning of treatment until recently when there was a temporary drop. It is now increasing. Stomach mass has decreased considerably from its maximum size. In early stages of treatment the anæmia became progressively worse, but is now improving. Only occasional vomiting.

CASE P 7.—Male, aged 37. In May, 1927, patient complained of a knot the size of a hen's egg on chest wall. On Dec. 1st, 1927, a biopsy was done and a diagnosis of fibrosarcoma made. Jan. 1st, 1928, courses of X ray and lead treatment were started. These were discontinued on Sept. 15th, 1928, because they had apparently produced extreme anæmia, and because the tumour involvement increased steadily unaffected by the treatment. *Condition at beginning of treatment:* Emaciated, marked secondary anæmia, just able to do a little walking outdoors each day. Considerable coughing. *Treatment:* With B.F. tuberculin begun on Nov. 27th, 1928, and has continued to present time. *Present condition:* Blood picture has improved. Has stopped coughing. Weight has stayed constant. Tumour has shown no growth during past four months, though steadily growing before that time.

Histological Changes.

Following the tuberculin treatment there are certain noteworthy changes in the tumour tissues which, in general, appear to be proportional in amount to the clinical damage suffered by the tumour. On the part of the stroma they consist: (1) of congestion of veins and capillaries, œdema and hæmorrhage, often attended by invasion by leucocytes—chiefly polymorphonuclear neutrophiles, lymphocytes, and plasma cells; (2) proliferation of fibroblasts; (3) hyaline change; (4) sclerosis with compression and distortion of the cancer alveoli, usually associated with atrophy (shrinkage) of the cancer cells.

On the part of the cancer cells the changes affect both nucleus and cytoplasm. In regard to the latter, perhaps the earliest change is swelling, associated with a loss of affinity for eosin, resulting in an appearance almost identical with that of cells in the early and midphases of mitosis. A more marked and probably later change is the appearance of larger and smaller round or oval vacuoles. In such cells, in material fixed in Zenker's fluid and stained with hæmatoxylin and eosin, there is to be seen very frequently a finely fibrillar meshwork, the spaces of which may appear empty or may contain finely granular material. In extreme degress of vacuolation, a single vacuole may fill nearly the whole of the cell, which is often markedly swollen and distorted. Larger vacuoles may contain finely granular matter, or larger or smaller hyaline masses, deeply stained with eosin. Frequently large vacuoles are ruptured with escape of their contents. Viewed with the low power these vacuolated cells, with their condensed cytoplasmic walls, resemble cysts of certain protozoa. A second important cytoplasmic change is a form of degeneration ending in the transformation of the cytoplasm into hyaline material with marked affinity for eosin. A third change, probably associated with rupture of the cell membrane is disintegration, with the escape of finely granular material, the granules being somewhat larger than those normally present. Such cells have apparently previously undergone swelling without vacuolation.

In consequence of these changes many alveoli consist of single or a double row of cells in various stages of vacuolation, hyaline change, or granular disintegration, surrounding a large or small central cavity containing tumour cells in various stages of the above-described degenerations, cell and nuclear fragments, fine and coarse granular material, hyaline in globules or in large wavy masses, and occasionally leucocytes. The nuclear changes include swelling, with dissolution of chromatic material, hyperchromatism, shrivelling, and fragmentation.

Method of Treatment.

The tuberculin used is a bouillon filtrate from Human Strain No. 37. The method of its preparation is fully described by Willis,[2] p. 137. We are greatly indebted to Dr. Allen K. Krause for providing the tuberculin for our work. In the treatment the tuberculin is injected subcutaneously. The dosage and interval are regulated according to the sensitivity of each individual patient, as determined by intracutaneous test with O.T. There appears always to be a definite reaction in the tumour involvement, wherever located in the body, following each injection of tuberculin. Our experience indicates that during the first six weeks of treatment the dosage should be kept low. At the end of about that period there appears usually to occur a definite change for the better in the patient's condition, although up to that time little in the way of definitely observable results of the treatment is to be seen. After the first six weeks the dosage may be cautiously increased, and this appears from our present experience to be advisable. But at all times great caution must be exercised, or the patient may be killed, either by the too rapid

[2] Willis, H. S.: Laboratory Diagnosis and Experimental Methods in Tuberculosis; Springfield, Illinois (C. C. Thomas), 1928.

production of toxic products from the alterations induced in the tumour tissue, or from something closely resembling allergic shock.

Arrangements were made on Jan. 28th, 1929, with the Harvard Medical School, and on March 19th, 1929, with St. Elizabeth's Hospital in Washington, D.C., to undertake the tuberculin treatment of series of cancerous patients in coöperation with this Institute. The work is already under way in these two institutions. Dr. Joseph C. Bloodgood also has recently started a series of cancer patients on tuberculin treatment.

This paper is a preliminary progress report only. The evidence which has so far been accumulated does not warrant any positive conclusion whatever regarding the ultimate therapeutic value of tuberculin in the treatment of cancer. The cases which have been treated are too few in number, and even in these cases the final outcome is still too uncertain to justify any far-reaching or final deductions. The clinical and histo-pathological results which have been obtained, however, taken in connexion with the positive conclusions from the study of the autopsy material already reported by Pearl (loc. cit.), are of a sufficiently promising character to warrant the continuation of the investigation. In a matter of this sort, where there is even a possibility that a therapeutic agent may be of value in the treatment of cancer, it is morally imperative that the medical profession be at once put in possession of the facts. Unquestionably the lives of some, if not all, of the patients whose histories are recounted above have been prolonged beyond the duration they would have realised had the tuberculin not been given. More than this cannot now be said. But even so much must, on humanitarian grounds, be made public to the medical profession. What is the most effective method of using tuberculin in cancer therapy, or what the effect of tuberculin would be on early cancer, and when used in combination with surgery, radium, and other modes of cancer therapy we are unable either to state or to predict, but obviously these matters want investigation, and in due time will doubtless receive it.

THE PAIN AND DISCOMFORT OF CONGESTIVE HEART FAILURE.

By K. SHIRLEY SMITH, M.B., B.Sc., M.R.C.P. LOND.,

MEDICAL REGISTRAR, MIDDLESEX HOSPITAL; LATE RESIDENT MEDICAL OFFICER, NATIONAL HOSPITAL FOR DISEASES OF THE HEART, LONDON.

THE investigations described in this paper were undertaken in order to determine the incidence and nature of pain and discomfort in congestive heart failure. The pain that is presumably of cardiac origin and also that arising from the various complications attendant upon failure are considered. In the first part of this paper details are given of the analysis of the pain associated with failure in 105 patients. In the second part an attempt has been made to discover from the history, the examination, and the progress of 33 of the patients the origin and significance of the various types and grades of pain. Angina pectoris has been excluded, except that a few patients have anginal pain although suffering from some degree of congestive failure. With nine exceptions the cases were in-patients at the National Hospital for Diseases of the Heart.

The following groups of cases have been included under the term congestive failure:—

(1) Patients with *severe failure*, showing such signs as orthopnœa, enlargement of the liver, and pulmonary and other œdema.

(2) Patients with *moderate failure*, having troublesome dyspnœa and some signs of venous congestion—for example, crepitations at the bases or hepatic engorgement.

(3) Patients with slight failure, in whom ***breathlessness*** is observed at rest, with or without slight œdema of the feet, not previously present.

(4) Patients complaining of *anginal pain on effort*, but also showing evidence of congestive failure as above.

The Frequency and Origin of Pain in Failure.

With the aim of determining the incidence of pain in failure and its distribution according to intensity and origin, an analysis was made of the cases admitted to the National Heart Hospital over a period of six months. The following Tables show the results of this investigation. Table I. needs no explanation. Table II. shows the incidence of pain in relation to its source.

TABLE I.

Total patients admitted to the National Heart Hospital during six months	173
Number showing signs of congestive failure	105
(*a*) Number complaining of pain associated with failure	67
(*b*) Number complaining of pain more than any other symptom	6
(*c*) Number having or developing pain not of cardiac origin (1) alone, (2) in addition to previous pain, presumably cardiac	14
(*d*) Number free from pain before and after admission	18

TABLE II.—*Sources of Pain and Discomfort.*

(*a*) *Presumably cardiac*—that is, no other cause is found (Table I. (*a* and *b*))	73
(*b*) *Due to complications or sequelæ of failure*:—	
1. *Pulmonary and pleural*—	
(*a*) Infarction of lung	5
(*b*) Hydrothorax, primary	1
(Two patients developing hydrothorax from failure had no new pain with it.)	
(*c*) Pleurisy only—i.e., friction only	1
(In this case there were no subsequent signs suggesting further lesion, such as infarction or hydrothorax.)	
2. *Hepatic or gastric.*—Right hypochondriac or epigastric pain with hepatic enlargement	10
3. *Œsophageal.*—Dysphagia	1
4. *Pain of œdema*:—	
(*a*) Sacral	2
(*b*) Above ankles	1
(*c*) Antero-internal aspect of thighs	1
5. *Pain of thrombosis* of systemic veins (popliteal)	1
(Many patients show more than one complication associated with pain, hence the total incidence is greater than the total number of cases (14).)	

(Œdema is generally regarded as painless. The complaint of pain in association with it might, at least in sacral œdema, be attributed to the discomfort of the recumbent position in bed. Yet the only patients who complained of sacral pain were found to have considerable œdema of the sacrum. One of the patients studied in detail, but not included in the above series, complained of the simultaneous onset of swelling of the legs and pain above the knees. The single instance of dysphagia in a series of 105 cases illustrates the rarity of this symptom in congestive failure. In view of the displacement of the œsophagus and the holding up at the level of the auricles of an opaque bolus, as shown by the X rays, a greater frequency of dysphagia might be expected.

Pain and discomfort may occur early or late. Early pain is almost invariably sternal and of cardiac origin, and occurs at the onset of failure. Late pain often arises from the heart, but it may be due to complications and therefore attributable to other organs.

I. *The Sternal Pain of Early Failure.*

A considerable proportion of all patients complaining of pain associated with congestive failure are found to have had sternal pain on effort at some time in their history; this pain has most commonly been experienced when the reserve of the heart was diminishing—that is, when breathlessness was noticed with less and less exertion, and when slight swelling of the ankles first made its appearance in the evenings. The pain is generally midsternal, and although it may be stabbing and rather severe, it is sometimes more a dull aching pain associated with a sensation of choking or of tightness across the upper part of the chest or

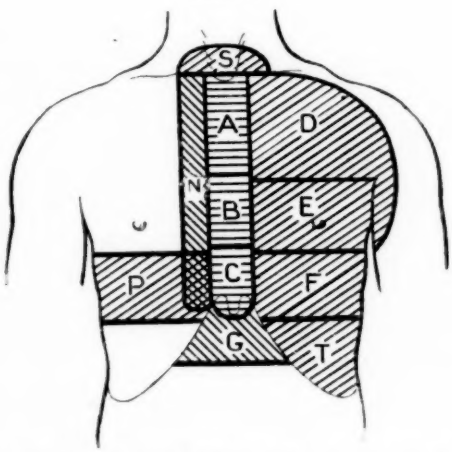
around the waist. Occasionally it is described as a feeling of oppression or of weight on the chest, though in such cases the symptoms amount to little more than discomfort. Concomitant breathlessness is always experienced in some measure. The sternal pain in early failure is always relieved by rest, so that patients remark that it passes off after a few minutes. There is radiation of the pain in a few cases. In some it is described as passing into the left arm (Cases 1 and 5); in others as passing straight through to the back (Case 2); and occasionally as spreading toward the left nipple (Case 3). As failure becomes established this pain is no longer felt.

It is the increasing breathlessness that is accompanied by the pain, and, similarly, the pain may diminish when the ankles begin to swell. If, from the 33 consecutive cases, the four suffering from angina pectoris are excluded, 29 remain. Of these 29 patients 13 experienced the sternal pain described above. The total of 13 excludes those patients suffering at times from sternal pain, but in whom the relation to exercise was not established. Sternal pain and tenderness on percussion over the sternum have been described by Libman [1] in subacute bacterial endocarditis. They are among the later manifestations of the disease and are therefore usually accompanied by cardiac failure. Although two or three cases of this disease were included in the 105 cases of failure studied, neither pain nor tenderness in the sternal region was observed in them.

II. *Pain Associated with Established Failure.*

Twenty-seven cases in which pain or discomfort were experienced in established failure have been classified according to the location of the pain. In order to facilitate the description of areas affected by the pain two diagrams were constructed (Figs. 1 and 2). In these the anterior and posterior aspects of the thorax were divided into the areas which were found

FIG. 1.



Composite diagram showing location and distribution of pain (anterior aspect).

to express best the numerous diagrams made from individual patients at the bedside. The names applied to these areas in the following description are self-explanatory, except that the term "parasternal" signifies an area lateral to the sternum and extending one inch from the sternal border.

1. *Sternal pain* (A, B, and C) was only complained of in relation to exertion, and was never present in the patients in hospital, except when these areas were involved by pain spreading from some other region.

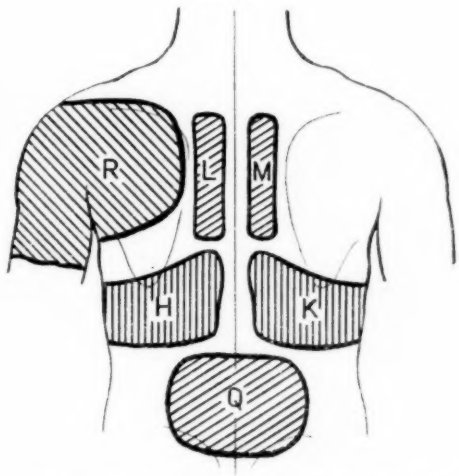
2. *Left Supramammary pain* (D) occurred only four times. The medial aspect of the upper arm was involved in all, and in two of them aortic incompetence was present.

3. *Left mammary and inframammary pains* (E and F) were more common than any others, being recorded 21 times. Of these patients 13 were fibrillating. Otherwise this group is made up of cases representing many varieties and combinations of cardiac lesions.

4. *Epigastric pain* (G) is found four times, in each case associated with considerable enlargement of the liver, and in two cases with rapid enlargement.

5. *Subscapular pain* (H and K).—(1) Bilaterally: two cases, associated with pulmonary infarction and

FIG. 2.



Composite diagram showing location and distribution of pain (posterior aspect).

coughing respectively. Both were cases of mitral stenosis. (2) Unilaterally: 11 cases (10 left-sided); 7 of these had mitral stenosis.

6. *Interscapular pain* (L and M).—(1) Bilaterally: two cases; both had mitral stenosis, one had aortic incompetence as well. (2) Unilaterally: four cases (three left-sided); three had aortic incompetence.

7. *Right parasternal pain* (N).—One case: aortitis and aortic incompetence.

8. *Right inframammary pain* (P).—One case: enlarged left auricle extending to the right.

9. *Lumbo-sacral pain* (Q).—Two cases, both with much sacral œdema.

10. *Left scapular and upper arm pain* (R).—One case, in angina pectoris, by spreading from left inframammary pain.

11. *Suprasternal pain* (S).—Three cases; in two angina pectoris was present, but the suprasternal pain occurred apart from the attacks. In the third case there was hypertension.

12. *Left hypochondriac pain* (T).—Three cases; in all of these very severe failure was present, the liver being greatly enlarged while œdema involved the legs, sacrum, and lungs.

Presence or Absence of Hyperalgesia and Superficial Tenderness.

In his pioneer work on the pain of heart disease Head [2] has described local and referred pain. The former is distinguished by its restriction to the body surface immediately superficial to the organ affected, and by tenderness on pressure over the affected part. Referred pain, also investigated more from its clinical aspects by Mackenzie,[3] is characterised by its distribution in areas remote from the origin of the pain and by hyperalgesia of the skin as elicited by pinching. Such pain is relieved rather than exacerbated by pressure. Thirty-three cases of congestive failure in which pain was a symptom have been examined in detail for hyperalgesia of the skin and tenderness of subjacent structures. Hyperalgesia was determined by pinching

up lightly between the finger and thumb a fold of skin over first one area and then another. If wincing resulted the sign was regarded as positive. When no evident response occurred the patient was asked whether there was any difference in the sensations experienced at various parts. Only three patients showed definite hyperalgesia. Superficial tenderness was tested by the pressure of the finger-tip at various points over the chest and back, and then by moderately heavy percussion. Patients who winced on pressure with the finger-tip or on percussion were regarded as giving a positive result; if no response was elicited inquiry was made as to whether discomfort was felt at any place on pressure or percussion. Fourteen patients showed superficial tenderness.

Separating the 31 cases studied into those with tenderness and hyperalgesia and those without it was found that of the 12 cases in the first group enlargement of the heart was great in 9, moderate in 2, and slight in 1. Among the 19 cases of the second group cardiac enlargement was great in 9, moderate in 4, slight in 4, and absent in 2.

TABLE III.

Size of heart.	Group I. (12 cases) (showing tenderness with or without hyperalgesia).	Group II. (19 cases) (without tenderness or hyperalgesia).
Great enlargement ..	9	9
Moderate ,, ..	2	4
Slight ,, ..	1	4
No ,, ..	0	2

Taking the highest recorded rate as the basis of comparison, Groups I. and II. were further contrasted with reference to the heart-rate. In Group I. (the patients showing tenderness or hyperalgesia) only one had a rate less than 100. Of the 19 patients without alteration in sensation (Group II.), nine had rates of less than 100. Although no quantitative conclusions can be drawn from the number of cases studied, it seems reasonable to infer from Table III. and the figures given above that patients with enlarged hearts and those with rapid hearts are more liable to tenderness and hyperalgesia. It is possible that this relationship merely indicates that these signs are more likely to be found in severely damaged hearts, which are more likely to be enlarged and beating rapidly. The factors of size and rate may, on the other hand, have a more direct influence upon the presence or absence of tenderness and hyperalgesia.

Time Relations of Pain and Congestive Failure.

The sternal pain of early failure always occurs in conjunction with breathlessness. This particular sternal pain seems always to represent or indicate incipient congestive failure, and a history of such pain is obtained in a large proportion of patients at the time when their symptoms were increasing (i.e., when failure was making itself apparent). Left inframammary pain is a common complaint in any medical out-patient department. The investigations of Parkinson [4] concerning this symptom and the related left scapular pain have shown that they occur often in patients who have no failure and, moreover, are quite common in patients free from heart disease. In a series of 50 cases Parkinson found that 25 had no physical signs of any sort. Conversely, this pain is frequently experienced by patients who have disease of the heart with or without congestive failure. Unlike the early sternal pain the left inframammary pain sometimes present in failure bears little or no relation to breathlessness; for example, the pain may come on while the patient is and has been at rest and has no dyspnœa at all. The factors which have been found to be of great importance in the production of left thoracic pain, whether or not heart disease is present, are fatigue and general ill-health. A patient may be free of the pain for some days or weeks and notice its gradual onset, not coincident with or immediately after excessive exertion, but one or two days later, evidently the latent result of general fatigue or of mental agitation rather than the immediate effect of a particular effort. While the incidence of left inframammary pain is usually without remarkable significance in failure, and is little criterion of the degree of failure, the spreading and intensification of pain originally limited to the left inframammary region is not infrequently a sign of advancing failure or some other adverse change in the condition of the patient.

Synopses of Illustrative Cases.

CASE 1, female, aged 53, had growing pains as a child but was otherwise well until August, 1927, when breathlessness, palpitation, and dull aching retrosternal pain were noticed on exertion. The pain became more severe as breathlessness increased, and after about six weeks it spread in the attacks over the left side of the chest and into the antero-internal aspect of the left arm. Examination in October, 1927, showed moderate congestive failure, enlarged heart, and completely irregular rhythm. The heart-rate was 150 on admission, there was a diastolic murmur at the apex, and superficial tenderness over the left side of the chest. Pain, tenderness, and failure disappeared with rest and digitalisation. Diagnosis: mitral stenosis, auricular fibrillation.

CASE 2, female, aged 27, had rheumatic fever in May, 1923, and frequent tonsillitis thereafter. In January, 1926, breathlessness, palpitation, and pain at the middle third of the sternum on exertion began. The pain used to "go through to the back" between the scapulæ, but it was completely relieved by sitting down for a few minutes. The symptoms were increasing and the ankles swelling before admission in July, 1927. Examination showed early failure, enlarged heart, rate 100, completely irregular, apical diastolic murmur, and left inframammary pain, but no tenderness. There was progressive improvement with rest and digitalisation. Diagnosis: mitral stenosis, auricular fibrillation.

CASE 3, male, aged 62, first experienced weakness and breathlessness in September, 1926. Sixteen months later his symptoms were increasing. At this time exertion was always followed by breathlessness and pain at the lower third of the sternum, spreading towards the left nipple. Relief was obtained in a few minutes by resting. Examination in February, 1928, showed early congestive failure with normal rhythm. The heart was slightly enlarged, and there was no valvular disease. The blood pressure was 145/80, and the Wassermann reaction negative. The arteries were consonant with the age. With rest and digitalis signs of failure disappeared, with simultaneous relief of symptoms. Diagnosis: myocardial disease of doubtful origin.

CASE 4, female, aged 33, gave a history of rheumatism and chorea. Breathlessness was first noticed at the age of 17, failure appearing at 29. Examination in August, 1927, showed severe failure with engorgement of the liver and much œdema, causing aching pain in the legs and lumbar region. Diagnosis: mitral stenosis, aortic stenosis, and incompetence, auricular fibrillation. There was a fair response to digitalis, but several severe bouts of tachycardia occurred during convalescence, and in these attacks there was great dyspnœa, accompanied by severe pain in the left side of the chest spreading over a wide area and round to the back. This painful and tender area gradually became more restricted as convalescence became established.

CASE 5, male, aged 57, was discharged from the army with chronic bronchitis in 1908. In November, 1927, he experienced retromanubrial pain on exertion, which gradually became more severe, and occurred even on trivial effort. Some weeks later there was also "sticking" pain under the left nipple, passing upward and down the inner aspect of the left arm. Examination in March, 1928, showed early failure, sinus rhythm, with occasional extrasystoles, a moderately enlarged heart, and an accentuated aortic second sound, but no valvular disease. The blood pressure was 240/180, and the vessels were slightly thickened, but the Wassermann reaction was negative. The urine contained trace of albumin. Diagnosis: arterio-sclerosis, hypertension, atheroma of aorta; chronic bronchitis and emphysema.

CASE 6, female, aged 41, had rheumatism and chorea at the age of 10, followed, after four years, by breathlessness and palpitation on exertion. Pain under left breast with palpitations appeared after labour at the age of 23, but although this pain had been acute in the past it had been definitely less severe since the ankles first swelled in 1924. She was admitted to hospital with pain in both inframammary regions. Examination in July, 1927, showed moderate failure, normal rhythm, and a heart greatly enlarged to right and left (orthodiagraph). Diagnosis:

mitral stenosis, aortic incompetence, adherent pericardium, and signs of aneurysmal dilatation of left auricle to right.

CASE 7, female, aged 42, had been breathless on exertion since she had had rheumatic fever as a child. Increasing exhaustion began in the spring of 1925 with left inframammary pain. In April, 1927, failure began, with dyspnœa and sternal pain. In August œdema of the legs appeared, but by this time all pain had gone. Examination in 1927 showed orthopnœa, pulmonary and sacral œdema with hepatic engorgement, a regular rhythm with a much enlarged heart, thickened arteries, and a blood pressure of 170/140. Diagnosis: mitral stenosis and aortic incompetence, with arterio-sclerosis and hypertension.

CASE 8, female, aged 39, gave no rheumatic history, but had had breathlessness on exertion with xyphisternal pain for two and a half years. In August, 1928, after excessive exertion, she experienced increasing symptoms with spread of pain under the left breast and violent palpitation. This occasion was probably the time of onset of fibrillation. Examination at this time showed engorgement of the liver, with œdema of the ankles and lungs, an enlarged heart, and completely irregular rhythm, with a diastolic thrill and murmur at apex. Diagnosis: mitral stenosis, auricular fibrillation.

CASE 9, male, aged 65, had had growing pains and tonsillitis as a child, and was rejected for the army in 1917. Since then he had had breathlessness and palpitation on exertion, with pain at the lower half of the sternum and swelling of the ankles at night. In 1924 severe attacks of palpitation began, and were always accompanied by left inframammary pain. Rates of 150 and 160 were recorded in these attacks, and fibrillation was shown by the electrocardiogram. Examination in March, 1928, showed gross œdema of the legs, sacrum, and lungs. The rhythm was completely irregular and the rate 130, with a radial pulse deficit of 20. X rays showed an enlarged heart, and an aorta widened in the antero-posterior view. The blood pressure was 210/115, and the Wassermann reaction negative. Diagnosis: auricular fibrillation and hypertension.

CASE 10, male, aged 24, first felt left inframammary pain in November, 1922, with cough. He was diagnosed as mitral stenosis, and admitted with cardiac failure. Since then he had had several attacks of left inframammary pain and hæmoptysis following coughing. Fibrillation was first observed in December, 1925. He has frequently felt better after coughing up blood. He was admitted in December, 1927, with severe cough, hæmoptysis, left infra-mammary pain spreading back to the left subscapular region, cyanosis, venous and hepatic engorgement, and a completely irregular rhythm. His heart was enlarged, and had a rumbling diastolic murmur at the apex. Diagnosis: mitral stenosis, auricular fibrillation.

CASE 11, male, aged 60, gave a history of syphilis. He did fairly heavy work until March, 1928, when his ankles began to swell, and he noticed breathlessness for the first time. There was slight cough, and subsequently attacks of left inframammary pain which were provoked by coughing. Examination in May, 1928, showed orthopnœa, pulmonary œdema, and gross œdema of the legs. The heart was greatly enlarged, and had a heaving apex-beat, a regular rhythm, and no murmurs, but pericardial friction. Diagnosis: chronic nephritis, hypertensive disease, and renal insufficiency.

Variability of Pain with Increasing and Decreasing Failure.

A review of the cases studied in detail discloses the following facts concerning the alterations in the pain as failure increases or decreases.

(*a*) The retrosternal pain related to exertion commonly experienced at the onset of failure passes off when the patient takes to bed, as it always has done when the patient rested himself. If this warning pain is disregarded it becomes more severe and supervenes with less and less effort (Case 5). As the pain increases in intensity it may also spread across the chest, most frequently to the left. In a few cases the upper and inner aspect of the left arm becomes also involved, over an area corresponding to the distribution of the second thoracic nerve (Cases 1 and 5).

(*b*) With the onset of definite congestive failure, as judged by œdema, the common left inframammary pain, if present, becomes aggravated, but only so long as the patient remains up and about. When rest is enforced the pain eases, but less quickly and completely than the earlier retrosternal pain.

(*c*) If there supervenes any event which impairs the action of the auricles and heart in general (e.g., abnormal rhythm, bronchitis, or other infection) the inframammary pain quickly returns, often becoming severe and spreading until a large area of the left chest is involved. Extension into the right side of the chest and the left arm and side of the neck may follow. As the condition of the patient improves the painful area gradually closes in day by day until the original small localised occasional pain only is felt (Case 4).

(*d*) In the few instances (e.g., Cases 6 and 7) where the patient has noticed less severe and constant inframammary pain as œdema has supervened, this has seemed attributable to the circumstances of the case, the patient being able to take more and more rest as it became more and more necessary. He thus began to avoid the stress which would have produced increasing pain.

Cause of Sternal Pain at Onset of Failure.

The multiplicity of theories advanced to account for the pain of angina pectoris proves the degree of ignorance that has prevailed on this subject. Mackenzie [5] and Allbutt [6] dealt extensively with this problem, and a comprehensive review has recently been made by Keefer and Resnik.[7] During the last few years the syndrome of coronary thrombosis and cardiac infarction has become more and more sharply delineated, and we now know that pain of anginal type and distribution, differing only from anginal pain in its prolonged duration of days or weeks, occurs concomitantly with necrosis of a portion of the myocardium. The inference is that anginal pain arises in the heart muscle. But if one lesion of the myocardium may cause pain of anginal type, similar pain may be caused by other conditions affecting the myocardium. Herrick and Nuzum,[8] Bullrich,[9] and Carey Coombs [10] have described angina in association with pernicious anæmia, and Bullrich has shown that this symptom abates and even disappears with improvement in the blood condition. It seems not unreasonable, therefore, to infer that retrosternal pain occurring with effort and accompanied by breathlessness is referable to temporary oxygen deficiency of the myocardium and is in reality a very mild type of anginal pain. The fact that when this pain occurs it is relieved almost at once by rest lends support to this supposition. Further, since the pain of angina pectoris is typically central and arises in the myocardium, by analogy the sternal pain of early failure arises from the same structure. A frequent contributing factor in the production of sternal pain in incipient failure is cough. In two of the 13 cases with a history of this pain it was remarked that the pain was aggravated by coughing. It seems likely that coughing produced this effect both by its inherent retrosternal discomfort and by putting a further burden on the already over-taxed myocardium.

Causes of Pain in Established Failure.

The following are some of the factors found to influence the onset of pain when failure has developed.

(*a*) *Exertion.*—It has been shown above that exertion does not at once produce pain, though pain may follow general fatigue.

(*b*) *Auricular Fibrillation.*—The 33 cases of failure which have been studied in detail include 16 cases of auricular fibrillation, of which 13 complained of left inframammary pain. Thus only three patients with auricular fibrillation escaped such pain, and since there were but 18 complaints of left inframammary pain, it is clear that this pain is in the majority of cases (13 out of 18) associated with auricular fibrillation.

(*c*) *Rate of the Heart.*—The correspondence of increasing left inframammary pain with the onset of fibrillation, as in Case 8, and with the onset of paroxysms of auricular flutter, as described by Parkinson and Bedford,[11] apart from the frequent assertion by patients that the pain becomes worse when palpitations occur (Case 9), suggest that the heart-rate is intimately related to the left inframammary pain experienced in failure. The tendency of the pain to disappear on treatment by digitalis and as the pulse-rate subsides supports this view. Further, although

the rate is falling, fibrillation is persisting, so there must be some factor beyond auricular fibrillation to account for the pain. That the pain of angina pectoris is often due to coronary disease and restriction of the blood-supply to the myocardium is not a new theory, but it has recently been further developed by Keefer and Resnik.[7] It it is true that the reduction of the oxygen-supply to the heart can produce anginal pain, the relationship between the rate of the heart and pain in failure seems explicable on the following grounds: the coronary vessels fill during diastole of the heart; when the rate increases the ratio between diastole and systole falls, the diastolic phase but not the systolic being shortened; there is thus less time for coronary filling and pain may ensue if the original blood-supply to the myocardium was only just adequate.

The association between pain and excessive rate of the heart has been further demonstrated by Barnes and Willius,[12] who have studied the occurrence of cardiac pain in paroxysmal tachycardia. Again, Schwartz[13] has shown that bouts of severe cardiac pain may arise in young adults with chronic valvular disease. In these patients the pain was always accompanied by violent and rapid beating of the heart.

(*d*) *Intracardiac Tension.*—It has been shown previously that cardiac enlargement is apt to be associated with tenderness and hyperalgesia of the chest wall, and the possibility of a causal relationship was suggested. Recent work on the occasional enlargement of the left auricle to the right may throw light upon this problem. Bedford,[14] and Bramwell and Duguid[15] have described the association between extreme left auricular dilatation to the right and pain in the right chest and axilla spreading to the right inframammary and right subscapular regions. Other cases have been observed by Labadille[16] and Mahaim.[17] This group of cases in which cardiac engorgement is a pronounced feature constitutes, as a whole, some support for the view that increasing intracardiac tension is a prominent factor in the production of the pain of established failure.

(*e*) *Coughing.*—In some instances pain in failure is partly to be attributed to coughing. In Cases 10 and 11 coughing was said to produce left inframammary pain, and in the first of these the pain spread through to the left subscapular region and tenderness developed over the affected parts. How this pain is produced seems doubtful. The onset of left-sided pain precludes the possible influences of increasing tension within the right side of the heart—an obvious result of prolonged coughing. Again, the causal relationship must be definitely established; for example, if cough results in the production of blood-stained sputum both cough and pain must then be considered as secondary to the initial event of pulmonary infarction. As cough generally arises from bronchitis this condition probably largely accounts for pain when it is retrosternal; when pain is lateral some other explanation must be sought. For example, it is obvious that much discomfort will be produced by coughing if there is hyperalgesia of the skin surface. Thus, in the light of present knowledge, pain in the left side of the chest produced or aggravated by coughing can only be ascribed to two causes—additional exertion, with concomitant increase in the pulse-rate, and repeated friction between the hypersensitive chest wall and the bed-clothes.

Factors Relieving the Pains of Failure.

The pains of failure may be relieved naturally in the course of the illness or they may yield to treatment. The following are the principal factors to be considered.

(*a*) *Establishment of Congestive Failure.*—The sternal pain of early failure is in nearly every case relieved by advancing failure, and when pulmonary and general œdema or hepatic engorgement have appeared this pain is no longer experienced.

(*b*) *Rest.*—Rest almost immediately relieves the retrosternal pain of effort. Inframammary and scapular pains are less rapidly relieved by rest and may continue but little abated after 24 or 48 hours in bed.

(*c*) *Hæmoptysis.*—The relief of thoracic pain and discomfort which sometimes follows hæmoptysis in failure may be regarded as support for the view that pain is produced by excessive tension within the lungs or right heart. This relationship is illustrated in Case 10, where the patient remarked that he generally felt better two or three days after an attack of hæmoptysis.

(*d*) *Therapeutic Measures.*—While the alleviation of pain and discomfort depend essentially upon removal of the underlying cause, some relief may be obtained by various measures. Sedatives such as bromide and chloral are useful, but the analgesics, for example, medinal, nepenthe, and liquor morphinæ hydrochloridi—may be required in severer cases and when insomnia from pain is undermining the general condition of the patient. Local applications are only to be recommended when pain is chronic and troublesome and when there is no danger of rendering an already hyperalgesic skin still more sensitive.

Angina Pectoris in Conjunction with Failure.

Among 105 patients with congestive failure only three were found to have angina pectoris. One other patient afflicted with both conditions was studied, making a total of four. Of these three were women, and the ages ranged between 43 and 57. Two of these patients were suffering from aortic incompetence. Syphilis seemed a likely ætiological factor, but in each case the Wassermann reaction was negative. In both the remaining patients there was disease of the aorta, this vessel being found higher and wider than normal on radioscopy. Negative Wassermann reactions were also given by these two patients. Three showed a systolic blood pressure of 200 or over, while that of the fourth was 145. In only one of the patients had anginal attacks occurred before the onset of dyspnœa, and in this case there was an interval of 14 months between the first attack of angina and the symptoms of early congestive failure. The history in all showed that the attacks of pain had become more severe and widespread as breathlessness became more pronounced; during treatment in hospital the attacks abated if they did not disappear.

No definite inferences can be drawn from four cases, but certain points are worthy of notice. Although the position of the pain and its radiation and relation to effort are typical of angina, there is an essential difference in the pain in these cases, since its onset is always more or less closely related to the beginning of congestive failure, and would seem therefore to depend upon morbid changes occurring in the myocardium. The complaint of dragging suprasternal pain in two of these four patients affords further proof of aortic disease, since it is generally believed that the arch of the aorta is segmentally referred to this area. This region, however, was not involved in the anginal attacks, so that no relationship is suggested between aortic disease per se and anginal pain.

Summary.

1. An analysis of 105 cases of congestive heart failure shows that only 18 escaped severe or incidental pain and discomfort. Pain was the primary complaint of 6 patients, while 67 experienced this symptom in addition to others more urgent. In 14 of the 105 patients the pain and discomfort arose from other structures than the heart.

2. Pain and discomfort due to complications or sequelæ of failure were found to be mostly pulmonary, pleural, hepatic, or gastric. Œdema, thrombosis, and œsophageal obstruction were also observed as causes of pain.

3. Pain of cardiac origin in congestive failure may be classified into: (*a*) the sternal pain of early failure; (*b*) the pain of established failure.

4. Sternal pain occurred at the onset of failure in 13 of the 29 cases analysed. It was always provoked by exertion and rapidly relieved by rest. Reason-

are given for believing this pain to be a very mild degree of angina pectoris.

5. The presence or absence of hyperalgesia and superficial tenderness were investigated in 33 cases. Only three patients experienced hyperalgesia, while superficial tenderness was present in 14. It was found that hyperalgesia and superficial tenderness were more apt to occur when the heart was much enlarged or beating rapidly.

6. The causes of pain in established failure are considered under the following heads: Exertion, cardiac rhythm, the rate of the heart, intracardiac tension, and cough.

7. Factors relieving the pains and discomfort of failure are described. These are, principally, rest, the establishment of failure, hæmoptysis, and therapeutic measures.

My thanks are due to Dr. John Parkinson and Dr. Evan Bedford for advice and criticism. For permission to use notes on patients under their care I am indebted to Dr. C. E. Lakin, physician to the Middlesex Hospital; to Dr. B. Hood, medical superintendent of the St. Marylebone Hospital, and to the honorary physicians to the National Hospital for Diseases of the Heart.

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A FATAL CASE OF NÆVUS UNDERGOING MALIGNANT DEGENERATION.

By P. CLENNELL FENWICK, C.M.G., M.D. N.Z., F.R.C.S. EDIN.,

OFFICER IN CHARGE, RADIUM AND DEEP THERAPY DEPARTMENT, CHRISTCHURCH HOSPITAL, NEW ZEALAND;

AND

J. RUSSELL WELLS, M.B. N.Z., F.R.C.S. EDIN.,

ASHBURTON.

THE radium department of Christchurch Hospital has records of malignancy following trauma in several patients. In one soldier a rodent ulcer developed over the site of a piece of shell fragment lodged in the face. In three women rodent ulcer developed in the small scar caused by a splash of hot fat, received while cooking. Sir G. Lenthal Cheatle has done much work on the relation of cancer to nerve and trophic areas, and we suggest that in the following case the slight trauma over the nævus was sufficient to destroy the trophic nerve-supply and render the area vulnerable to malignant degeneration.

The Case Described.

A young lady, aged 19 years, consulted one of us (J. R. W.) in March, 1928. She had a small nævus on the left temporofrontal region. Six weeks before seeking advice she had knocked the nævus, and from that time had noticed that it was growing larger, was irritable, and tended to bleed at the slightest touch.

Examination showed a nævoid growth, about the size of a split pea, just at the hair-line in the left temporofrontal area. It was raised above the skin but not pedunculated. Two other small nævi were present on the left parieto-occipital region, and a large nævus, the size of the palm of the hand, was present between the scapulæ. This had been treated with radium for 16 months five years earlier, and was partially healed. It looked angry but was apparently quiescent.

Excision of the nævus on the forehead was advised, as a transition to malignancy was feared. The growth was excised on March 12th by an elliptical incision one-quarter of an inch beyond the margins of the growth and down to the pericranial tissues. The sutures were removed on the seventh day and the wound was then soundly healed. On June 5th the patient returned, and a recurrence of the nævoid growth was found in the centre of the operation scar, and also a small swelling in front of the left ear, in or on the parotid was noted. The patient was sent to Christchurch Hospital for radium treatment. A full-strength radium plaque was applied over the forehead nævus for 15 minutes, the dose for children being ten minutes. It was impossible to say whether the firm round swelling the size of a walnut found in front of the left ear was a growth of the parotid or a lymphatic gland; it was fixed and hard, though not tender.

On July 3rd the patient returned. The nævus had shrunk to a pin-point but the swelling in front of the ear was still present. On August 21st the patient was sent again to the radium department for further consultation. The nævus had practically disappeared, but the growth over the parotid was larger and several firm glands were felt in the left posterior triangle of the neck. Immediate operation was advised. On Sept. 4th one of us (J. R. W.) removed all the glands, making a wide dissection of the whole area. The growth over the parotid was excised. The pathological report showed malignant disease, so the patient was sent to Christchurch for radium packs. On Sept. 19th a radium pack of 240 mg. of element in platinum tubes was applied at a distance of 3 cm. over the neck, and a similar pack of 50 cm. was applied over the parotid area. The time of exposure was 48 hours.

The patient returned home. No recurrence appeared in the neck or face, but secondary growths appeared below the left breast, on the right side of the neck, and in the right axilla. The liver became greatly enlarged, ascites and pleural effusion supervened, and she died on Nov. 26th, about nine months after the injury to the forehead nævus.

Pathological Report.

Dr. A. B. Pearson, the superintendent of the pathological department, examined the parotid growth, and reported as follows:—

The tissue consists of a portion of salivary gland and supporting connective tissues. The tissue is invaded by a tumour of malignant peritheliomatous type. The appearances in the actual tumour are extremely variable in different areas. In some parts the tissue consists of whorled masses of closely compact cells supported in a fine but scanty connective tissue stroma, and in these masses a very small blood-vessel is frequently noticed in the centre of the cell masses. In other areas the cells are grouped in lobulæ, in the centre of which well-marked vessels or sometimes large blood spaces are clearly seen. In these very vascular areas the vessels or blood spaces are lined by a layer of flattened endothelial cells supported by a thin layer of connective tissue cells which are, in turn, surrounded by a thick mass of large malignant cells. In this particular position the tumour consists entirely of this tissue of vessels with thick layers of surrounding cells. The groups or lobules seem to be in contact with each other. No connective tissue can be seen between them. In all parts the general cell features are very similar. They are usually oval in shape, with granular cytoplasm and very large oval-shaped nuclei. Very commonly they show pronounced hyperchromatic staining. Occasionally giant cells are present. These cells have one nucleus each, which is very deep-staining, but in one area groups of giant cells are present, and these are of unusually large size and very irregular shape. They show a very large amount of cytoplasm and contain several large irregular nuclei. Quite a number of these cells contain ingested leucocytes and dark-brown pigment. Mitotic figures in the general cell tissue are very common.

The tumour tissue shows widespread areas of necrosis and liquefaction. The tumour has invaded parts of the salivary glands, but the main growth appears to be in the lymph gland. The lymphoid tissue of the gland is completely destroyed and, in some cases, the capsule is invaded. The general features suggest a rapidly growing and highly malignant tumour.

The points of interest in this case are as follows. A very healthy girl receives a slight blow upon a

small nævus and nine months later is dead of widespread malignant disease. If is, of course, recognised that nævi can take on a malignant character, but the channels by which the malignant cells are spread is sometimes uncertain. In this case the metastasis appeared to follow the lymph channels, and the pathologist mentions that large blood spaces were reproduced in the metastatic deposits. Apparently the nævoid type was reproduced—that is, a slight trauma over a nævoid area caused some change to occur in the nature of the lining cells of the nævus which altered the character of the growth from benign to malignant, and these altered cells were carried to distant parts of the body and reproduced themselves in lymph glands.

THE "CŒLIAC AFFECTION"—IDIOPATHIC STEATORRHŒAS.

By T. E. HESS THAYSEN, M.D.,

PHYSICIAN-IN-CHIEF TO THE MEDICAL DEPARTMENT, ST. ELIZABETH HOSPITAL, COPENHAGEN.

In describing the "cœliac affection" Gee [4] says that it "is commonest in patients between one and five years old. Sometimes from India Englishmen return sick with the cœliac affection; seldom it is met with in adults who have never left our island." Since Herter [7] in 1907 rediscovered the occurrence of the cœliac affection in children, describing it under the name of "intestinal infantilism," later authors have only paid attention to cases in children and have forgotten that Gee also observed this lesion in patients returning from India and in adults who had never been abroad.

The cœliac affection that attacks Englishmen in India can hardly be anything but sprue. The symptoms Gee describes as characteristic of cœliac affection—pronounced emaciation, white diarrhœa, anæmia, and muscular atrophy—are just as characteristic of both diseases as are the negative macroscopic findings in the digestive tract, which Gee emphasises in the autopsy of cases of cœliac affection. Gee does not mention the presence of stomatitis—a complication of tropical sprue that could hardly be unknown to him—probably because there are cases of tropical sprue, especially in India, in which the stomatitis is inconspicuous or absent. It might seem more difficult to identify the instances of "cœliac affection" that Gee observed in patients who had never been outside England. Of course, one cannot altogether exclude the possibility that these were cases of pancreatogenous fatty diarrhœa. Gee, however, does not mention the presence of sugar in the urine—it is present in most cases of pancreatogenous fatty diarrhœa—and he did not find the conspicuous macroscopic changes in the pancreas (atrophy, tumour) that are the cause of this disorder. Assuming, therefore, that he had the opportunity of making a post-mortem examination of these cases it is most likely that they were cases of a lesion resembling sprue. Nothing, however, is known of the occurrence of such a lesion in England in the days of Gee.

At a meeting of the Royal Society of Tropical Medicine in 1899 Thin [33] reported that two colleagues had diagnosed sprue in a patient who had never been outside his native country, and questioned the diagnosis. Manson-Bahr [13] has met with only one instance. In other countries, also, reports of a sprue-like disease in individuals who have never been in the tropics (Mense,[16] Talma [28]) were exceedingly scarce until recent years, when it has been definitely established that such a lesion really does occur, and further that it is far from being so rare as was thought. It is therefore very likely that Gee's cases of cœliac affection were instances of that sprue-resembling disease later described as non-tropical sprue. Under the term "cœliac affection" Gee includes the lesion later called cœliac disease (Miller [17]) or intestinal infantilism (Herter [7]), or "schwere Verdauungsinsufficienz des Kindes jenseits des Säuglingsalters" (Heubner [8]) together with tropical and (probably) non-tropical sprue. My object in this communication is to discuss whether these three diseases are so nearly related that one is justified in grouping them under a common designation.

Comparison of Sprue with Gee-Herter's Disease.

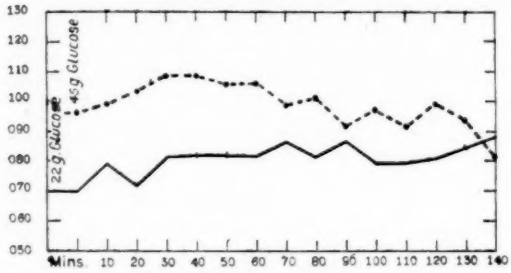
It is generally assumed that tropical and non-tropical sprue are the same disease, although this cannot be proved, as the ætiology and pathogenesis of both lesions are unknown. I shall therefore have to content myself with showing that Gee-Herter's disease and sprue are very nearly related and most probably identical lesions—a view that has been advanced before, on account of the conspicuous similarity in their symptomatology and course. Before I discuss the objections that have been raised against this view I shall briefly call attention to the most important points of resemblance in their clinical features and pathological anatomy. The patients have a strikingly characteristic appearance. They are markedly emaciated, their subcutaneous fat has disappeared, and their muscles are flaccid and atrophic. The large, meteoristically distended abdomen—particularly marked in children—forms a striking contrast to the thin extremities and the gaunt trunk. The skin is loose, pale, of a greyish, faded hue, without turgor, dry, often brownish. Other outstanding symptoms are: fatty diarrhœa, meteorism, anæmia, changes in the mucous membrane of the tongue, often mental disorder, achylia gastrica, and poor appetite alternating with ravenous craving for food. Organic changes in the nervous system are rarely present. A low blood-sugar curve after ingestion of glucose and abnormalities of the basal metabolism are to be found, and tetany is a frequent complication. In Gee-Herter's disease there is halisteresis which has also been demonstrated in cases of non-tropical sprue (Holst [9]).

The pathologico-anatomical findings are few, but almost identical in the two conditions. In several cases—and, it seems, more frequently in tropical than in non-tropical sprue and Gee-Herter's disease—there is enteritis or enterocolitis, and atrophy of the parenchymatous organs, with occasional fatty degeneration. These diseases occur most often in people with a previous intestinal lesion—in the tropics, especially amœbic dysentery. In some cases the disease runs an acute course with violent diarrhœa and pronounced emaciation, but the lesions—particularly in non-tropical sprue and Gee-Herter's disease—are apt to become chronic, with alternating periods of improvement and apparently unexplainable exacerbations. Tropical sprue is said to be seldom definitely cured unless the patient moves to another climate. A similar effect from change of climate may be seen in non-tropical sprue and in Gee-Herter's disease. One of my patients (No. 1) suffered constantly from steatorrhœa while at home; his stools became perfectly normal during a stay in France, and when he returned home the fatty diarrhœa set in anew. In Gee-Herter's disease also remissions have been observed when the children are moved to some other locality.

The mortality in Gee-Herter's disease is estimated by Schaap [24] at 13 per cent.; Halblützel-Weber [5] found it to be about 23 per cent. Of 23 patients with non-tropical sprue five are known to have died, but one died from an accidental complication. From tropical sprue Manson-Bahr [12] reports seven deaths in 45 patients with pronounced gastro-intestinal symptoms and stomatitis. If he had included cases with severe anæmia the death-rate would certainly have been higher. The lesions are not as clearly defined as would be desirable, since there are cases of sprue and of Gee-Herter's disease in which the fatty diarrhœa is not pronounced. Future investigations will have to decide whether such cases should be distinguished from the classical ones.

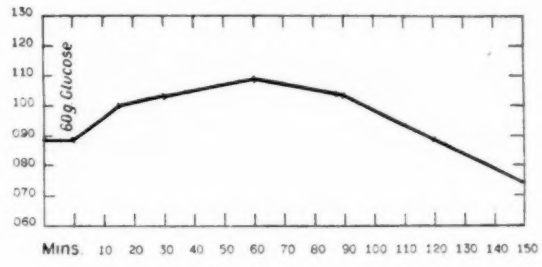
The pathogenesis is generally agreed to be an absorption-disturbance which primarily concerns the fats in the food, together with calcium salts and water and, to a lesser extent, proteins. But there is still a great deal of uncertainty with regard to the cause of this absorption disturbance. Judging from the literature, enteritis is rather frequent in tropical sprue.* If on this account the absorption disturbance is regarded as due to an intestinal lesion, even in cases where microscopic examination of the intestines gave negative results (v. d. Scheer [26]), non-tropical sprue and Gee-Herter's disease must also be considered as due to an intestinal lesion, even though it is rarer to find enteritis on microscopic examination in these conditions than in tropical sprue. Our knowledge of pathological changes in the intestines is so deficient that a lesion of the intestinal wall might easily exist without being recognised. Four fatal cases of non-tropical sprue were examined microscopically; in two of these (Blumgart,[2] Holst [9]) the intestinal wall showed no inflammatory changes; in one (Rosendahl [23]) it showed a slight, subchronic enteritis which, the author thinks, could not have been the cause of the protracted diarrhœa. Only one case (Manson-Bahr [15]) from Palestine showed definite colitis. It should be borne in mind that acute and chronic enteritis are very common lesions in the tropics. On the whole I agree with those who are sceptical of enteritis as the cause of these diseases.

FIG. 1 (Case 9).



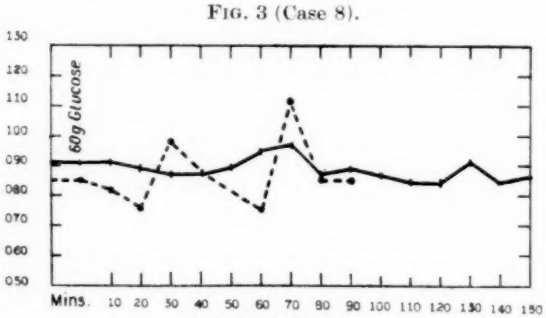
Gee-Herter's disease.

FIG. 2 (Case 14).



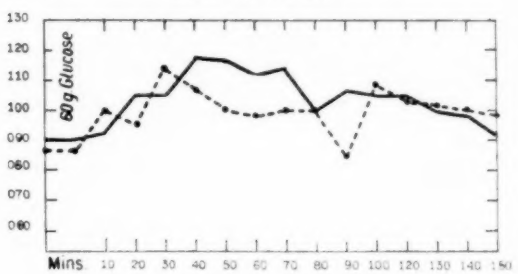
Tropical sprue.

FIG. 3 (Case 8).



Non-tropical sprue.

FIG. 4 (Case 5).



Non-tropical sprue.

*Several of the microscopic changes described are due to autolysis.

Objections to the Identification of Sprue and Gee-Herter's Disease.

In a discussion at the Royal Society of Tropical Medicine Reginald Miller [19] is reported as follows: "Owing to insufficient knowledge of the two diseases there was no agreement as to whether cœliac disease was the same as sprue, but there were notable differences. Cœliac disease always originated in childhood and, even without treatment, there was amelioration as maturity was reached. It was very seldom fatal, and did not occur in epidemics. Among children the essential feature of the disease was disorder of fat absorption, and it has nothing to do with intestinal disease, in many cases there being no diarrhœa and usually no ulceration of the tongue." In the same discussion Arthur Powell [21] emphasises the following points: "In sprue post-mortem examination invariably revealed a shrinkage of the liver and great attenuation of the stomach with loss of epithelium; these conditions were not observed in cœliac disease, which was characterised by enlarged spleen and great pain in the stomach. Vomiting was more frequent in cœliac disease than in sprue. In cœliac disease the appetite was poor and capricious, whereas in sprue it was the opposite. There was a tendency to dropsy in cœliac disease, while there was shrinkage of the body in sprue." Schaap,[24] who has described three cases of Gee-Herter's disease, states:—

"La maladie cœliaque a également des rapports avec la sprue (l'aspect et la constitution chimique des fèces, l'anémie), pourtant la glossite aphteuse typique qui mène a l'atrophie fait défaut, bien que la langue dans la maladie cœliaque puisse présenter aussi des anomalies moins accentuées."

In discussing the differential diagnosis between sprue and Gee-Herter's disease, Lehndorff and Mautner [11] declare:—

"Die Frage der Differentialdiagnose zwischen Coeliakie und Sprue hat bei der Seltenheit der letzteren in Europa für uns nicht viel Bedeutung. Die klinische Aehnlichkeit beschränkt sich auf die groben Züge der Krankheit, rezidivierende Diarrhoeen von jahrelanger Dauer, abnorm lichte Fettstühle, eine kleine Leber in einem sehr grossen aufgetriebenen Abdomen, allgemeine Schwäche und Gewichtsverlust; gemeinsam ist ferner beiden Affectionen die negative Kalkbilanz und die Häufigkeit einer komplizierenden Tetanie. Die für die Sprue charakteristische Mundaffection, eine Glossitis mit aphthösen Geschwüren an der Zunge, kommt bei der Coeliakie nicht vor. Ein weiterer Differenzpunkt besteht darin, dass die Sprue in einzelnen Gegenden epidemisch auftritt, die Coeliakie ist auschliesslich ein Leiden der frühen Kindheit, während die tropischen Aphthen fast nur Erwachsene befallen."

Thus all the authors cited are agreed that there are such great differences between sprue and Gee-

Herter's disease that the two lesions cannot be taken as identical. But the arguments advanced against this view are somewhat conflicting. Miller [17] and Lehndorff and Mautner [11] emphasise that typical aphthous stomatitis is not met with in Gee-Herter's disease, whereas Schaap [24] emphasises that similar, although less pronounced, changes do occur in Gee-Herter's disease. The last author is decidedly wrong when he states that atrophic glossitis does not occur in Gee-Herter's disease. Powell [21] finds that shrinkage of the liver, which is typical of sprue, does not occur in Gee-Herter's disease, in which, on the other hand, there is enlargement of the spleen. In this, however, he is in conflict with other authors, who lay particular stress upon the liver dullness being diminished and the spleen shrunken in Gee-Herter's disease. That difference in the appetite which Powell mentions does not exist; nobody else has been able to observe it. The occasional appearance of œdema of the face and hands in children with Gee-Herter's disease does not constitute any essential difference between this disease and sprue; it may obviously be regarded as "hunger-œdema." In this connexion I may add that the thinning of the stomach wall with loss of epithelium, which Powell takes to be characteristic of sprue, is a purely post-mortem phenomenon.

The greatest difficulty in recognising sprue and Gee-Herter's disease as nearly related—probably identical—conditions originates, I think, from the view that sprue is a wholly tropical disease that only attacks adults, and that Gee-Herter's disease is a disease of temperate zones that only attacks children—an idea that is definitely expressed by Lehndorff and Mautner. Sprue is not a wholly tropical disease. The literature contains, to my knowledge, records of 23 cases of sprue which developed in temperate climates in patients who had never been in the tropics. These were: 3 in Holland (Nolen,[20] v. d. Scheer,[27] Talma [28]), 7 in Germany (Hegler,[6] Mense,[16] Richartz,[22] Schäffer,[25] Wilfert [34]), 1 in England (Manson-Bahr [13]), 1 in Norway (Rosendahl [23]), 9 in Denmark (Holst,[9] Thaysen [31]), 2 in the northern United States (Blumgart,[2] Lambright [10]). The disease is also met with in Morocco (Begg [1]) and Palestine (Manson-Bahr [14]). One is therefore fully justified in claiming that sprue is not exclusively a tropical disease and that it probably occurs in any country, even though it is most frequent in some countries with a tropical climate. This fact, which will undoubtedly be further established in the future, makes it necessary once more to discuss the question of the near relationship between sprue and Gee-Herter's disease.

With regard to the second main objection against this view—namely, that sprue attacks only adults and Gee-Herter's disease only children—I quote some observations by Manson-Bahr.[15] In his excellent book, "A Report on Researches on Sprue in Ceylon," he writes (p. 23) as follows:—

> "It is generally stated that sprue is seldom seen in Europeans below middle age. Nevertheless, it may develop *at any age, even in children* of European parentage. Van der Burg states that he has recognised the disease in children of 1½ to 4 years of age, though it is as a general rule extremely rare in young adults. The oldest man I saw in Ceylon suffering from sprue symptoms was a burgher of 76 years of age, the oldest European a man of 70; the youngest was a boy of 13 of mixed parentage. I have, however, reason to believe that the disease occurs in natives at a still earlier age. I saw a Tamil boy of 8 who presented typical sprue symptoms, of which he died four months later."

In the tropics sprue thus attacks children too, and one of the reasons why it is diagnosed so seldom may probably be that in children it usually has an acute and fatal course and does not develop into the more chronic Gee-Herter's disease, which is always regarded as a "disease of luxury." Heubner [8] emphasises that most of the cases of Gee-Herter's disease occur in the socially well-to-do classes.

Table I. contains the cases of non-tropical sprue and the cases—known to me—of Gee-Herter's disease in older children in which there is some information as to the onset of the disease. Of course, I realise that the onset in such cases is a difficult question to settle. Table I. shows that of 11 cases of non-tropical sprue four developed before the age of 20 years, and one of these even occurred in a child of 11 years. Among six cases of Gee-Herter's disease one began at the age of 13 years and two at the age of about 10 years. Though it is true that in the great majority of cases Gee-Herter's disease develops in the earliest years of life, it may also make its first appearance at a more

TABLE I.—*Age of Patient at Onset of Lesion.*

Non-tropical sprue.				Gee-Herter's disease.			
No.	Age. Sex.	Age at onset of symptoms in years.	Author.	No.	Age. Sex.	Age at onset of symptoms in years.	Author.
1	44 M.	23	Thaysen.	1	9 F.	8	Schaap.
2	32 M.	18	,,	2	20 M.	10	Bramwell.
3	54 M.	20 (?)	,,	3	18 M.	10	,,
4	39 F.	37	,,	4	18 F.	5–10	Moorehead.
5	43 F.	41	,,	5	17 F.	13	,,
6	57 F.	56	,,	6	9½	ca. 9	Halblützel-Weber.
7	56 F.	40	,,	—	—	—	—
8	53 F.	17	Holst.	—	—	—	—
9	11 M.	?	Thaysen.	—	—	—	—
10	30 F.	16	Lambright.	—	—	—	—
11	39 F.	37–29	Wilfert.	—	—	—	—

advanced age; and even if most instances of sprue occur in adults, it may also develop in children. We find all ages represented—possibly with the exception of puberty (13–15 years), which recalls the fact that Miller and other authors state that children with Gee-Herter's disease improve when they reach puberty. On the whole these data go to show that it is impracticable to maintain the greatly emphasised difference between sprue and Gee-Herter's disease—namely, that the first is seen only in adults and the latter in children only. Gee is right, I think, when he introduces his paper on the "cœliac affection" with the following words, which have since been forgotten or overlooked: "There is a kind of chronic indigestion met with in persons of all ages, yet is especially apt to affect children between one and five years old."

Aphthous Stomatitis in Sprue.

In a discussion at the Royal Society of Tropical Medicine the condition of the tongue was particularly mentioned. Thin pointed out that there are two forms of sprue: one, especially frequent in the Indian archipelagos, is characterised by very marked changes in the mouth and tongue; the other, common in India, is characterised by violent diarrhœa, while the tongue does not undergo any change before the later stages of the disease. The tongue and oral cavity may be free from inflammatory alterations, even when the disease has persisted for several years. Tropical physicians, as far as I know, agree that alterations of the tongue in sprue are inconstant in occurrence and extent, and that there are forms of sprue—the well-known hill-diarrhœa, for instance—which are not complicated by aphthous stomatitis. Schaap [24] states that the tongue in Gee-Herter's disease may show similar changes to those of sprue; and Lehndorff and Mautner [11] point out that the tongue in Gee-Herter's disease is the site of a diffuse red irritation. Common to both diseases is the frequent occurrence of smooth atrophy of the tongue. The aphthous stomatitis in non-tropical sprue is not as a rule very conspicuous and shows but slight aphtha formation; it is not infrequently absent in the acute attacks. In this respect non-tropical sprue bears more resemblance to the sprue of India.

Considering the non-specific character of this stomatitis and its occurrence as a secondary phenomenon (v. d. Scheer [26]) in a group of diseases whose main symptom is fatty diarrhœa, I cannot see any reason for denying the near relationship—and even identity—of sprue and Gee-Herter's disease on the

basis of a difference in the appearance and extent of the stomatitis.

To the above-mentioned symptoms common to sprue and Gee-Herter's disease I may add two more—the low blood-sugar curve and the abnormal basal metabolism. Ingestion of glucose (about 60 g. in adults, 1 g. per kilo in children) gives a rise of the blood-sugar curve amounting to about 60 or 70 mg. per cent. when the rise is defined as the difference between the highest blood-sugar value obtained and the fasting value, and provided that Hagedorn and Norman Jensen's technique is used and the blood samples are taken every 10 or 15 minutes. Even under these conditions, however, the rise of blood sugar varies somewhat, both in different normal individuals and in the same individuals on different days. A low blood-sugar curve—that is, a curve with a rise of 40 mg. per cent. or less—is found as an inconstant phenomenon in about 5 per cent. of the blood-sugar curves of normal individuals. I have demonstrated that such a low blood-sugar curve is considerably more frequent (50 per cent.) in sprue and Gee-Herter's disease than in normal people (Figs. 1, 2, 3, and 4).

TABLE II.—*Blood-sugar and Basal Metabolism in Sprue and Gee-Herter's Disease.*

No.	Age. Sex.	Date of examination.	Blood-sugar rise in mg. per cent.	Date of examination.	Basal metabolism (Benedict) per cent.	Remarks.
1	44 M.	16/6/25	27	—	—	Fatty diarr. Hyp. anæmia. Tetany.
		20/1/26	41			
2	32 M.	21/1/25	40	29/2/28	+18·3	Fatty diarr. Anæmia.
		13/2/27	54			
		14/1/28	50			
		24/9/28	39			
3	54 M.	29/5/25	55	29/8/25	+19·7	Fatty diarr.
		21/3/28	53		+21·0	Hyp. anæmia. Tetany.
4	38 F.	3/11/26	39	19/5/28	+16·3	Fatty diarr. Anæmia. Tetany. Pigmentation.
		4/11/26	38			
		21/1/28	37			
5	43 F.	26/10/27	20	22/3/27	+43·0	Fatty diarr.
		6/1/28	28	15/5/28	+30·8	Anæmia.
		7/2/28	27		+30·8	Pigmentation.
		28/6/28	40			
6	57 F.	14/10/26	82	25/5/28	+17·8	Previously: Fatty diarr., hyperchromic anæmia and glossitis.
		4/2/28	84		+22·3	
7	56 F.	21/1/28	84	19/6/28	+12·8	Ditto.
		16/2/28	73		+11·6	
8	33 F. Holst	11/9/26	6		÷ 7·3	Fatty diarr.
		25/9/26	27		+11·0	Hyperchromic anæmia. Glossitis.
9	11 F.	15/2/28	17	12/3/28	+43·0	G.-H. dis. Tetany. Pigmentation.
		16/2/28	12			
10	4 M.	21/8/28	31			G.-H. dis.
		3/10/28	16			
11	7 F.				+19·6	G.-H. dis. (Schaap).
12	8 F.				+33·9	Ditto.
13					Normal.	G.-H. dis. (Lehndorff-Mautner).
14	47 M.	12/8/27	21	16/5/28	+12·6	Tropical sprue.
		3/1/28	51		+13·6	Tetany.
15	49 M.	12/1/25	63			Tropical sprue.

Diarr. = diarrhœa. Hyp. = hyperchromic.
G.-H. dis. = Gee-Herter's disease.

Table II. gives a survey of the blood-sugar findings in 12 patients. Nos. 6 and 7 had almost recovered and their blood-sugar curves were normal. Of the remaining ten patients eight (Nos. 1, 2, 4, 5, 8, 9, 10, 14) showed a low blood-sugar curve. In three cases (Nos. 1, 2, 14), however, the low blood-sugar curve was less constant, as examinations here sometimes showed a rise higher than 40 mg. per cent. Nevertheless, in all cases the higher rise occurred at times when the condition of the patient had improved considerably. Patient No. 5 likewise shows a higher rise in a good period (about 40 mg. per cent.) than was found on the three preceding examinations, which all were made during a poor period. These findings, together with the normal blood-sugar curves in greatly improved patients (Nos. 6 and 7), indicate that this abnormality subsides with recovery. Investigations that are still being carried on to explain how the low blood-sugar curve is brought about have shown its origin to be the same in sprue as in Gee-Herter's disease, and that it is not due to lowered absorption of the ingested glucose.[34]

The other metabolic abnormality common to sprue and Gee-Herter's disease is change in the basal metabolism. Of 12 patients examined one case of Gee-Herter's disease has once shown a normal basal metabolism (Lehndorff and Mautner), two cases of non-tropical sprue (Nos. 2 and 8) showed the basal metabolism to be lowered as much as 18 per cent., while the remaining cases showed an increase of the basal metabolism reaching as high as 43 per cent.

The objections, therefore, that have been raised against the view that sprue and Gee-Herter's disease are nearly related—probably identical—diseases are of no significance, and the low blood-sugar curve and the abnormal basal metabolism contribute further towards establishing the identity of these two lesions.

Conclusions.

The recognition and correct interpretation of non-tropical sprue forms the connexion between Gee-Herter's disease and tropical sprue and contributes towards establishing the near relationship, nay, the probable identity, of these diseases. Judging from the clinical manifestations, Gee-Herter's disease is just as identical with tropical sprue as is non-tropical sprue; the most conspicuous differences—infantilism, the rare occurrence of a pernicious blood picture and the frequence of halisteresis in Gee-Herter's disease—are readily explained by the fact that this disease is described in children. No one has suggested that these symptoms argue against the identity of these diseases. Gee is most likely right in grouping these conditions under one term—"the cœliac affection"—as representing the same lesion, but as long as their ætiology is unknown and their pathogenesis is obscure, it might be more correct to classify them as a special group of diseases, so as to emphasise their near relationship rather than to insist on an identity no one can prove. I have called this group "the idiopathic steatorrhœas" in order to emphasise that the chief symptom of the disease in its origin differs from those of the better-known forms of steatorrhœa: the pancreatogenous, the acholic, and, most likely, also of the enterogenous fatty diarrhœa.

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Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTION OF OBSTETRICS AND GYNÆCOLOGY.

AT a meeting of this Section held on May 17th the chair was taken by Dr. J. S. FAIRBAIRN, the President, and a short note was communicated by Mr. HERBERT SPENCER on

A Straight Rod Pelvimeter.

This, he said, was a simple instrument which, when carefully used in a patient fixed on a level steady table, gave an accurate measurement of the true conjugate. The device consisted of a straight rod, pointed at one end and rounded at the other, with two uprights.

Mr. G. I. STRACHAN then read a paper on

Contra-indications to Irradiation in Carcinoma of the Cervix.

He said that such impressive results had been obtained by certain workers that in a number of centres radium was now used exclusively, but opinion was sharply divided on the wisdom of this procedure. In inoperable cases radium was now used to the exclusion of other methods and in many instances growths had disappeared temporarily or permanently. The idea had therefore got abroad that any inoperable case could be treated with radium. This was incorrect; unless cases were properly selected the patient might be made worse. There were five definite contra-indications.

1. An extreme degree of general emaciation and cachexia usually meant a foul surface to the growth, extreme anæmia, and massive extensions; in these cases radium was likely to produce a rapid deterioration and early death.

2. Extreme anæmia with a red cell count of less than three millions or a hæmoglobin index below 40 contra-indicated radium, which in itself tended to produce some anæmia.

3. Extensions and metastases might be contra-indications. Radium should not be applied if hydronephrosis or pyonephrosis was suggested by the presence of a tender swelling in the loin, for this implied ureteral involvement and obstruction, and radium would only increase the obstruction by causing fibrosis in the broad ligaments. Extensions to bladder or rectum, as shown by frequency, dysuria, rectal tenesmus, or induration and fixation, would require the insertion of radium needles dangerously close to bladder or rectal wall, hastening fistula formation. Fistulæ were absolute contra-indications, for radium caused sloughing and enlarged the opening.

4. Any inflammatory pelvic lesion, such as a foul sloughing condition of the growth, would mean massive necrosis under radium, with toxæmia and the likelihood of pelvic parametritis or peritonitis. Pyometra was equally important, and an attempt should always be made to pass a sound through the cervical canal before radium was inserted. If a thin stream of pus escaped the uterus should be drained before inserting radium. There was risk of peritonitis if radium was used in the presence of salpingitis, pyosalpinx, or pelvic abscess. Suspicion should be aroused by severe pelvic pain, tenderness and fullness in one or both lateral fornices or behind, with a persistent temperature up to 101° F. These inflammatory complications were more common than was generally recognised, and were difficult to feel even under anæsthesia if there was much parametric thickening.

5. Where the whole pelvis was caked and infiltrated by extension a local remedy like radium could do little good, and it was better to leave the patient in peace.

6. Any evidence of impaired metabolism, especially defective excretion of nitrogenous waste products, was a danger signal, and radium should be withheld.

These contra-indications were of two types—the temporary, which cleared up under appropriate treatment, and the permanent ones like ureteric involvement or extension to bladder and rectum. In the former case radium could be applied when the contra-indication had been removed. An indiscriminate application of radium to these cases had led to unfortunate and sometimes disastrous results. Radium should only be used by those who had had special study and experience.

The PRESIDENT agreed that grave cachexia was a very important contra-indication.

Mr. MALCOLM DONALDSON feared lest the wave of enthusiasm for radium should result in a following wave of depression and depreciation.

Dr. EDGAR HAYDON spoke of the serious anxieties of the irradiator, and mentioned that a small surface dose would often enable him to find the cervical canal amidst much sloughing. The dangers of salpingitis could not, he thought, be over-estimated.

Mr. VICTOR BONNEY read a paper on the

Results of Surgery Compared with the Results of Radium in Carcinoma of the Cervix.

Up to the end of 1923 he had performed Wertheim's operation for carcinoma of the cervix on 265 patients out of 420 seen. There were 105 five-year survivals, so that his relative cure-rate was 39·6 per cent. and his absolute cure-rate 25 per cent., and these figures would be higher but that for the purposes of the present comparison he had reckoned as dead of cancer 21 cases who had either been lost sight of or died of some other disease before their five-year cure period was up. Of the 265 patients operated on the regional glands removed were carcinomatous in 113 and not carcinomatous in 152, giving a gland-involvement rate of 42 per cent. Of the 113 whose glands were carcinomatous, 27 survived their operations five or more years, a cure-rate of 23·8 per cent., whilst of the 152 whose glands were not carcinomatous, 78 survived their operations five or more years, a cure-rate of 51·3 per cent.

In comparing the results of surgery with those at present obtainable by radium it was necessary to emphasise what was not generally appreciated—that the scope of radium applied from the vagina was no wider than that of surgery, because radium applied that way did not reach out to the regional glands. Out of every hundred unselected patients presenting themselves at a radium clinic roughly 40 were certainly beyond the scope of radium, for at least that number had carcinomatous glands by the time they presented themselves. On the other hand, out of every hundred unselected patients presenting themselves at a surgical clinic, roughly 40 also were beyond the scope of surgery on account of gross extension of the growth to parts operatively irremovable. These two groups of 40, however, were not identical, for that which was beyond the scope of radium included certain cases not beyond the scope of surgery, and that which was beyond the scope of surgery included certain cases not beyond the scope of radium. The surgeon could distinguish the 40 per cent. beyond the scope of surgery, for he could open the abdomen to make sure, but the radiologist was at the disadvantage that he could not detect the cases that made up the 40 per cent. refractory to radium and hence had to treat them, though all unknown to him, failure was fore-fated.

By either method, therefore, only somewhere about 60 cases out of every 100 presenting themselves unselected beforehand could be treated with more or less chance of success.

Results Compared.

The radiological figures he would contrast with his own five-year results were those of Heyman from the Radiumhemmet at Stockholm and those of Gray Ward from the Women's Hospital, New York, for they were the most favourable to radium yet published. Heyman's figures related to the cases he treated from

1920 to 1923—i.e., after operative treatment had been abandoned by the Swedish surgeons, so that they represented an unselected series, and the same applied to Gray Ward's as he had abandoned operation.

It had been objected that comparison between surgery and radium was vitiated because radiological clinics got sent to them a larger proportion of patients with advanced disease than did surgical clinics, but this objection disappeared in communities where operation had been entirely superseded by radium, for the cases then presented to the radium clinic became as representative of the cases in the community at large, as were the cases attending a gynæcological clinic. That the average advancement of the growths in Heyman's and Gray Ward's cases was about the same as that of the cases presenting themselves at an ordinary gynæcological clinic was shown by the fact that the proportion of cases *in extremis* (i.e., unsuitable for radium) in their series was no larger than that encountered by the gynæcologist.

The comparative figures were as shown in Table I. :—

TABLE I.

—	Cases seen.	Five-year survivals.	Absolute cure-rate (per cent.).	Cases treated.	Five-year survivals.	Relative cure-rate (per cent.).
Bonney ..	420	105	25	265 operations	105	39·6
Heyman ..	467	106	22·7	444 radiated	106	23·8
Gray Ward ..	138	31	22·4	134 ,,	31	23·1

The last of these comparisons was unfair to radium for he, the speaker, had operated on only 63 per cent. of his patients, whilst Heyman had radiated 95 per cent. of his, and Gray Ward 97 per cent. of his, and it was obvious that the cure-rate would be the higher the smaller the percentage of cases treated.

The Radiological Operability Rate.

In the endeavour to make comparable the results attained respectively by surgery and radium, the patients treated by radium had been clinically classified into four groups of which the first two comprised those in whom the growth was limited to, or had only slightly passed beyond, the cervix. These cases were termed "operable," and their proportion to the total number of cases radiated had been called the "radiological operability rate." It bore, however, no relation to the operability rate of surgery, which was the proportion the number of patients operated on bore to the total number of cases presenting themselves. Moreover, operation was by no means always barred by wide extension of the growth, and the result was that the "radiological operability rate" was always much lower than the surgical operability rate, so that when the results of the cases styled "operable" by the radiologist were contrasted with the results of the cases operated on by the surgeon the latter were prejudiced, as shown in Table II.

TABLE II.

—	Cases treated.	Percentage of total cases.	Five-year survivals.	Cure-rate (per cent.).
Bonney ..	265 operated on	63	105	39·6
Heyman ..	186 Cl. 1 and 2 radiated	39	76	40·8
Gray Ward..	32 radiated	23	17	53·1

Results in Gland-free Cases.

It was possible, however, to make a much fairer comparison by contrasting the results he, the speaker, had obtained in his group of gland-free cases operated on, which represented a selection of 36 per cent. from all the cases he had seen, with the results Heyman and Gray Ward had obtained from their class 1 and 2 cases which represented a selection of 39 per cent. and 23 per cent. from all the cases they had seen respectively (Table III.).

TABLE III.

Gland-free cases operated on.	Per cent. of all cases.	Five-year survivals.	Cure-rate (per cent.).
Bonney: 162	36	78	51·3
Class 1 and 2: Cases radiated.			
Heyman: 186	39	76	40·8
Gray Ward: 32	23	17	53·1

There was a further method of statistical comparison that had the advantage of throwing some light on the question as to which cases are most likely to be cured by operation and which by radium. Out of every 100 patients presenting themselves to Heyman and Gray Ward respectively, only 60 (i.e., those whose glands were uninvolved at the time they presented themselves) were within the scope of radium treatment, whilst of those who presented themselves to him, the speaker, 63 out of every 100 were able to be operated on. Out of the 444 cases presented to Heyman, therefore, only 266 were in reality treatable by radium with any chance of success, and of Gray Ward's 130 only 82. Regarded in this way the figures worked out as shown in Table IV.

TABLE IV.

Cases presented.	Cases within scope.	Percentage of total cases.	Five-year survivals.	"Scope" cure (per cent.)
Bonney: 420 ..	265	63	105	39·6
Heyman: 467 ..	280	60	106	37·8
Gray Ward: 138 ..	82	60	31	37·7

This calculation showed that supposing it were possible to limit the use of radium to cases in which the glands were uninvolved the percentage of cures it would effect relative to the number radiated would be about the same as those effectable by surgery operating on both gland-free and gland-involved cases relative to the number operated on. Moreover, if one assumed for simplicity a gland-involvement rate of 40 per cent. for all the cases presented to himself, Heyman, and Gray Ward, then of the 420 cases presented to him 252 were gland-free and of these he cured 78, whilst Heyman, out of 266 gland-free cases, cured 106 and Gray Ward out of 82 cured 31, showing that if there were no such thing as glandular involvement radium would give better results than surgery. It was on the gland-involved cases that surgery attained its numerical superiority in absolute-cure-rate over radium, for all these cases were beyond the scope of the latter. Table V. made this clear :—

TABLE V.

—	Total cases seen.	Gland-uninvolved cases = 60 %.	Cures.	Rate (per cent.).	Total cases seen.	Gland-involved cases = 40 %.	Cures.	Rate (per cent.).
Bonney ..	420	252	78	30·9	420	168	27	16
Heyman ..	467	280	106	37·8	467	187	0	—
Gray Ward	138	82	31	37·7	138	56	0	—

Conclusions.

The figures and considerations he had put before them showed that the results he had obtained by Wertheim's operation were numerically better than those obtained by Heyman and Gray Ward by radium. It should, moreover, be remembered that, owing to the facilities enjoyed by the Radiumhemmet, none of Heyman's patients had been lost sight of,

whereas he had lost sight of 13 patients, all of whom were counted for the purposes of this comparison as having died of recurrence. If amongst these 13 cases lost sight of there were only 5 five-year survivals (which was probably an under-estimate) he had really cured 110 out of the 265 cases he had operated upon. Moreover, his figures included patients operated on many years ago when his operative mortality-rate was 20 per cent. instead of 11 per cent. as it stood to-day for his last 100 cases.

Inoperable Cases.

He had kept no record of the 155 cases which he had to abandon as inoperable. Some were abandoned before radium came on the scene, and though many of those who came after were treated with radium it was at a time when the results of radium therapy were far different from what they are now. But the point was that, had he been able to treat these abandoned cases by radium in the same manner as they would be treated now, a certain proportion of them would have been cured. Heyman, between 1914 and 1916, had 17 cures out of 97 "inoperable" cases treated by radium; so that out of his, the speaker's, 155 inoperable cases somewhere between 15 and 20 should have been cured, which, together with five cures out of the 13 cases lost sight of, would have raised the total number of cures effected by him from 105 to between 125 and 130 out of the 420 cases originally presenting themselves—a result far superior to anything afforded up to the present by radium treatment alone.

Mr. Bonney said that he had dealt solely with the results of operation on the one hand and radium applied from the vagina on the other, for no evidence was yet available as to the results capable of being attained by radium applied through the abdomen as well as through the vagina, or of radium applied through the vagina in combination with operative extirpation of the regional glands. The latter appeared to him to combine the advantage surgery possessed in being able to reach out to the regional glands with the advantage that radium possessed in being able to ablate the local growth without resulting deformity and without injury to the bladder and rectum when these were involved. A good many years, however, must elapse before judgment on these matters could be passed. At the present time, in spite of the improved results of radium treatment, a greater number of lives could be saved by subjecting to operation all patients whose growths were removable by an expert in this branch of surgery, and treating the remainder by radium, than by using radium to the exclusion of surgery.

Discussion.

The PRESIDENT said he was glad Mr. Bonney had made out such a good case for surgery, since there was a danger that the pendulum would swing too violently to the side of radium.

Dr. SIDNEY FORSDIKE said that Mr. Bonney's figures were not comparable with any save those of the Wertheim clinic, but was he content with a 25 per cent. cure rate? Surgery had shot its bolt in the treatment of carcinoma of the cervix, but there was no doubt that the pendulum was swinging too rapidly. The practitioner who wished to apply radium must study for several years if he wanted satisfactory results. In a certain percentage of cases, where the only finding after treatment was a thickening in the vaginal roof, recurrence took place high up in the pelvic glands; for these radium must fail.

Dr. A. J. WRIGLEY showed graphs of the results obtained at St. Thomas's Hospital on 148 cases treated from 1918–1922. The five-year cure rate was 15 per cent. Eighteen per cent. of the cases had been considered operable, 20 per cent. borderline, and the rest inoperable. The end-results for the operable and borderline cases were about 10 per cent. better than Heyman's, but so much depended on the estimate of operability that this figure did not count for much. Cases had been treated either by Wertheim's operation or by total hysterectomy followed by radium. The former group showed slightly better results for the borderline cases, and the latter for the "operable." Of the inoperable, those untreated were all dead in 18 months, and most of them in 6 months. Of those treated with radium, half lived four months longer, but of the minority who survived the rate lengthened to four and a half years. Radium needles had only been in use three and a half years, but the survival rate curve, if continued to the five years, would be a little below Heyman's 13 per cent.

Mr. HERBERT SPENCER stressed the importance of knowing the meaning of "operability."

Mr. DONALDSON said that it was very difficult indeed to compare results of radiation and operation, and that only the absolute cure rates were comparable. It was a very big assumption that the same type of case went to Bonney as to Heyman. Radium was in its infancy, and much better figures would be obtained in the course of the next five years.

Mr. WILLIAM GILLIATT said that since 1923 he had treated all cases with radium, submitting the operable one to a Wertheim operation four to six months later. He had been struck by the small amount of operative difficulty caused by the radium. The patients did much better than those not treated by radium, and the fear of vaginal complications was much reduced.

Mr. D. C. L. FITZWILLIAMS said that Mr. Bonney's figures had proved that radium did almost as well as surgery, and, moreover, it must be remembered that radium figures were based on the work of pioneers. The operative and survival rates obtained by Lawson Tait would shock any hospital board to-day. The great radium centres had become stereotyped: radium ought to be distributed to many more centres and the advance would then be rapid.

Reply.

Mr. BONNEY, in reply, said he had tried to put the case fairly. His figures were not exceptional. The surgeon needed to treat a much smaller proportion of the cases presented to him than did the radiologist in order to obtain the same number of cures, and from the unoperated-on remainder rather over 10 per cent. of cures could be obtained by radium according to the latest figures of Heyman that he had given, whereas the radiologist had no residuum, having used up his stock of material in obtaining his results. The wave of enthusiasm for radium was very foolish and bound to be followed by disappointment. Far greater skill was required to get good surgical results than to get good radiological results. He had only one standard of operability—could he get the thing out?—and he operated up to the limits of possibility. The choice was not between surgery and radium but between surgery with radium and radium alone. His own operability rate was founded on an accurate computation at a time when the cases presented to him and Mr. Comyns Berkeley formed a sample of the cases in the community at large.

SECTION OF TROPICAL MEDICINE.

AT a meeting of this Section held on May 15th the chair was taken by Dr. J. B. CHRISTOPHERSON, the President. The Secretary, Dr. W. BROUGHTON-ALCOCK, communicated a paper by Prof. A. BESREDKA on

VACCINE THERAPY.

The power of antivirus to act directly and specifically on receptive skin cells had been shown, he said, by the well-known experiments on anthrax, and its value had now been extended to the cells of the alimentary tract. Vaccine treatment by the mouth had reduced the morbidity and mortality from dysentery when used prophylactically and therapeutically. It was as effective as serum, if not more so; it was never contra-indicated, was easily applied, and caused no unfavourable results. Of 3000 men treated in the Rhine Army none contracted dysentery, while 471 cases occurred among untreated men. For typhoid, oral vaccine had taken its place as ordinary practice. Of 4140 men treated with oral antivirus preceded by bile, not one developed typhoid; of 549

treated without bile 0·07 per cent. were affected. Oral vaccination was the only method adapted to rapid immunisation of large communities. Therapeutically applied, it could prevent the gradual encroachment of the *Bacillus typhosus* on cells which were still healthy, and cut short the period of illness. Moreover, the patient so treated would not become a carrier. Extensive experiments in Russia, Germany, France, and India had shown that the treatment was equally valuable for cholera and entero-colitis. Our ignorance of the intestinal flora in the latter condition was a great obstacle to progress, but the results were too good to be disregarded. Chronic diarrhœa in children yielded rapidly to oral antivirus, and the results in severe colitis were notable. Very good results had been obtained in pyelonephritis, but when a renal lesion was present as well as intestinal disorder, the oral treatment should be supplemented by instillation of antivirus into the renal pelvis and bladder. Of 31 cases of pyelonephritis, most of them previously treated unsuccessfully with hexamine and stock subcutaneous vaccine, only 11 had proved resistant to antivirus. Acute cystitis was relieved after four or five instillations, but chronic cystitis required 10 to 15 daily treatments. The results in urinary sepsis were very good and occasionally even remarkable.

Antivirus in the Eye, Nose, Throat, and Ear.

The eye had a greater degree of autonomy than any other organ; eye diseases rarely influenced the rest of the body, and the eyes were usually unaffected by general immunities. Immunity of the cornea did not even extend to the anterior chamber, but was confined to the cells which had actually been in contact with the immunising agent. Ordinary inoculation was useless to the ophthalmologist, so that he welcomed local immunisation which, used systematically and early, would undoubtedly save many eyes. The best results had been obtained in blepharitis, conjunctivitis, ulceration of the cornea, and dacryocystitis. Sometimes a temporary aggravation followed the treatment, but this could be overcome by bathing with sterilised water and was usually followed by speedy and complete recovery. Simple instillation usually gave good results, but the antivirus could also be applied on a pomade with vaseline and lanoline. Autogenous preparations were better than stock ones. Local vaccine had a startling effect on furunculosis of the ear; the introduction of a wad of cotton-wool soaked in antivirus immediately reduced the pain, while swelling and redness disappeared in a few days and the expulsion of the core was accelerated. For otitis media 10–15 drops should be instilled into the ear, and a gauze lampwick soaked in vaccine should then be put in place. One case of chronic otitis media had been cured in 20 days, and it was reasonable to hope for more results when the flora of this condition was better known. In nasal infections subcutaneous vaccine was useless, and disinfectants could not be expected to do good when they acted on the surface only and weakened the mucous membrane. Local vaccine treatment was, however, very successful; it established a strong osmotic drainage as soon as the wicks were withdrawn together with the accumulated pus. This hypersecretion swept all before it and shortened both acute and chronic stages of sinus disease. Where surgery was unavoidable, pre- or post-operative use of the virus was valuable. Ozæna was usually regarded as insusceptible to treatment, but antivirus had given very favourable results. For chronic laryngitis the treatment could be applied directly by means of a vapouriser several times daily. Intratracheal applications were being more and more used, especially for pulmonary gangrene and bronchiectasis. Some day it might be possible to dry up, if not to cure, tuberculosis. Ulcerative stomatitis, gingivo-stomatitis, suppurative gingivitis, glossitis, acute periostitis with abscess, and alveolitis after extraction could all be treated by injection of antivirus into the tissues or by dressings. Neuralgia was stopped in about two hours, always within 12 hours; suppuration cleared up in a few days and splinters were expelled. Antivirus acted with peculiar speed and thoroughness where classical treatment was useless or very slow in action. The results of its use in pyorrhœa alveolaris had been very satisfactory.

Antivirus in Gynæcology and Dermatology.

The use of antivirus in pelvic conditions was in its infancy and each worker had his own way of applying it. Improvement had been recorded in metritis, alone or with extensions to surrounding parts. For the former, ovules or compresses were applied to the cervix, and for the later intradermic antivirus was applied to the lower abdomen. It could be used preventively or curatively for puerperal conditions and for mastitis. It provided the most rational procedure for the prevention of breast abscess. It gave most encouraging results in pyodermatitis, lessening suffering, permitting return to ordinary life, and guarding against relapse. Hundreds of boils and carbuncles had been treated by antivirus, on dressings or intracutaneously. Impetiginous abscess, sycosis, acne, sores, burns, and erysipelas yielded to it. Buboes were better in 24 hours and healed in four days if they were punctured and the released pus replaced by antivirus. Soft chancre turned to a healthy looking sore. Local vaccine treatment of urethritis encountered difficulties on account of the anatomy of the parts. Results had been uneven in the male, but good in the female, even after other methods had proved useless. Antivirus therapy was being used more and more in surgical cases before, during, and after operation, especially for intervention in septic organs. It had also endless scope in veterinary practice.

The Case against Antivirus.

General W. F. HARVEY said it was difficult to know exactly what Prof. Besredka meant by antivirus; sometimes he spoke of it as specific; sometimes as non-specific; sometimes as if it acted on the cells, and at other times as if on the bacteria; sometimes as if it were dead; and at other times as if it were living and capable of multiplying and penetrating tissues. The method had been used in the army for gonorrhœa, and centrifugalised washings of young cultures had been found better than old ones. Intradermic use was giving quite good results. Oral vaccination for intestinal disorders had been tried in the army 20 years ago, and the investigators had at that time concluded that the production of antibodies in the blood was very irregular; agglutinins were never produced. Antivirus had been used for dysentery in the Shanghai Expeditionary Force, but unfortunately the method was so harmless that nobody would consent to act as controls, and the 5000 men had all had it. In the first season there had been 28 cases of dysentery, and in the second season 48 cases of proved dysentery and 400 of enteritis. These patients had undoubtedly had antivirus, so that the protection was not complete.

Prof. ALEXANDER FLEMING agreed that it was difficult to discover what antivirus was. Prof. Besredka seemed to ascribe the inhibitory action of old broth culture to some specific antibody; in the past it had been thought to be due to exhaustion of food substances or accumulation of waste products. In some cases the latter was undoubtedly the cause. There were probably many factors contributing to the end-result. Prof. Besredka seemed to expect antivirus to penetrate where antiseptics would not go—e.g., to the nasal submucosa—and spoke of an "osmotic drainage," which suggested a process other than that of immunisation. He claimed wonderful results for this exhausted broth, but relied chiefly on clinical reports by workers not under his own supervision. Clinical reports, as every advertiser knew, could be obtained. A number of people had produced evidence that applications of ordinary broth had the same effect as antivirus, both acting by attracting phagocytes in large numbers. Prof. Fleming had recently grown

a certain mould in broth and found that after about ten days the broth developed an inhibitory action on pyogenic cocci, even in considerable dilutions. The results of applying this broth to suppurative conditions were as good as, if not better than, those cited by Prof. Besredka. There was no specific immunising effect at all. The medium used in antivirus treatment might have more implications than any specific immunising action.

Prof. J. C. G. LEDINGHAM contributed a paper (read by the President) in which he said that only the experienced clinician, trained to evaluate data from many therapies, could wisely assess Prof. Besredka's results. In scarcely a single particular had his views of the action of antivirus been accepted. The skin of laboratory animals could be so treated by specific and non-specific means as to withstand and localise infections of low virulence. If the infection were highly virulent only the specific antibody would produce immunity. Poultices impregnated with ordinary broth could make a skin area an unsuitable medium for any infection. Their action was probably twofold: increase of vascularity, bringing more antibody from the general circulation, and stimulus to the local reticulo-endothelial cells by the small amount of antigen present. The local defences at various points varied greatly in intensity, but all parts were vulnerable if a sufficient dose of infection were introduced. Oral vaccination could give some immunity against intestinal infections, but it was doubtful if this could compare with an adequate dose of vaccine subcutaneously.

Dr. GRAHAM FORBES said that many people had been unable to repeat Prof. Besredka's results with dysentery, but rhino-inoculation gave better results and was especially suitable for hypersensitive and delicate infants. It might prove valuable for nasal diphtheria and carriers.

Dr. DENNIS EMBLETON said he had tried repeatedly to obtain results from antivirus treatment and had failed. The paper had consisted of extravagant claims for treatment and some claims for prophylaxis; these two parts should have been kept separate. The work had not been brought forward in a scientific manner; claims had been based on small series of cases. The paper ought not to have been brought forward and fathered by the Society in this way, for it might carry weight with people who could not judge and estimate the value of the work.

Dr. BROUGHTON-ALCOCK remarked that antivirus had had an extensive trial and there was a good deal of literature about it.

Dr. H. S. STANNUS commented on the lack of first-hand information about antivirus and said there should be more before the method was condemned, and Dr. EMBLETON explained that he had not intended to condemn the method, but only its form of presentation that evening, which was not such as to carry conviction.

MEDICAL SOCIETY FOR THE STUDY OF VENEREAL DISEASES.

A MEETING of this Society was held in London on May 3rd, with Colonel L. W. HARRISON in the chair. A paper on

VASOSTOMY AND ITS PLACE IN THE TREATMENT OF EARLY URETHRITIS

was read by Mr. FRANK KIDD, who said the operation had not yet been practised in this country, though it was projected in 1905. Until 1928 Mr. Kidd had reserved it for chronic cases of vesiculitis. He had been struck by letters to THE LANCET (1928, i., 883 and 989) last year from Mr. Peart, who said he had employed vasotomy with satisfactory results. Criticisms on a priori grounds had followed in the correspondence columns, but they were by people who had not had experience of the procedure. Mr. Kidd had long noticed that many cases of early urethritis presented themselves in which the condition was confined to the anterior urethra. But after a week or two of irrigation, when all signs of discharge had disappeared and the urine was clear, it suddenly became hazy, with the supervention of acute prostatitis and vesiculitis, which required several months of treatment. In a number of cases he thought a quiet ascent of gonococci took place, the organisms lying dormant in the prostate or epididymis for some weeks before either manifesting their presence or dying out. In some cases, he suggested, if the patient indulged in alcohol or venereal excess, or had influenza, or treatment was too strong, though the anterior urethritis disappeared, the resistance of the deeper tissues broke down, bacteria came through, and the result was violent deep urethritis, prostatitis, vesiculitis, and even epididymitis. In these cases it seemed quite reasonable to cut down and fill each vesicle with colloid silver, or any other substance which would bring about complete and quick destruction of the organisms.

Though it was not easy to persuade patients who suffered from early gonococcal urethritis to submit to vasostomy, he had dealt in this way with five selected cases at St. Paul's Hospital, and observed the final results. Three were cases of early acute posterior gonococcal urethritis. The first had had his trouble a little over a fortnight, and had developed a deep posterior haze and a swollen, tender prostate. Mr. Kidd cut down on each vas, and washed out each vesicle with 5 c.cm. of a 5 per cent. solution of colloid silver. Daily posterior irrigation with weak permanganate was given for three days. He left the hospital and had no treatment of any kind since. He was followed up for three months and was found to be cured. Never before had the speaker seen acute posterior urethritis cured in three days by any method. The second patient had posterior urethritis, with swollen prostate, as a result of contact 13 days previously. Posterior daily irrigation was given for nine days after the operation, but Mr. Kidd was unable to follow up the case. At the ninth day gonococci could not be detected in the urethra, and there was no discharge. The third case was very dramatic. Acute gonorrhœa was contracted on June 4th, 1928, and on the 18th the patient was admitted into St. Paul's Hospital with profuse hæmaturia, strangury, and greatly increased frequency of micturition. Each attempt at irrigation brought on hæmaturia, therefore he was left in bed for a time. On July 11th, as no progress was being made, Mr. Kidd cut down on each vas and washed out each vesicle with colloid silver. Three hours after the operation pain, frequency, and hæmorrhage had vanished, and urethral discharge disappeared the next day. Sometimes in chronic cases, after washing out a vesicle, there was still some pus, and the vesicles were somewhat thickened, but no gonococci were found. The next patient had had gonorrhœa two months; he had had the disease twice in the past, each time with some arthritis. Mr. Kidd washed out the vesicles with 5 per cent. colloid silver, and afterwards gave posterior irrigation with permanganate once daily for eight days. The discharge disappeared but the patient still had fever, so 1 c.cm. of symmetrical urea products ("s.u.p. 36") was injected intramuscularly on three successive days. On the twelfth day the fever had wholly departed, there was no discharge, the urine was clear, and the joint trouble cleared up. He was kept under observation until the twentieth day, but without further treatment, and he went out with no discharge and the urine clear. Another case was that of a man aged 68 who contracted severe gonorrhœa. His doctor had failed to carry out irrigation properly; the only result of it was to project other germs into the urethra, including *B. coli*, and the discharge became severe. Mr. Kidd, under local anæsthesia, washed out each vesicle through the vas, and the patient was irrigated daily for a week. The discharge disappeared, but the urine remained hazy for some weeks, though no more gonococci or further discharge were to be seen.

Irrigation was discontinued, and hexamine was administered, and then the case cleared up.

Mr. Kidd submitted that, small as was the total number of cases brought forward by Mr. Peart and himself, the results justified further research and comparison of notes. Surgeons in the Services enjoyed good opportunities for carrying out this treatment, which produced such rapid results in suitable cases. Then the question of ensuring a continuance of treatment while on board ship or on foreign service would not arise. He did not advocate it for every early case, as many cases of anterior urethritis reacted quickly to irrigation, controlled by the urethroscope. There were also many posterior cases of urethritis which reacted in two or three months to prostatic massage and posterior irrigation. But he was sure that in a large number of cases this operation of vasostomy would be of distinct use. Certainly it would enable the medical man to tide over the acute embarrassment of a man returning from abroad with the disease who was expected quickly to rejoin his wife; also for the young who became infected shortly before marriage. He intended to use the operation more in joint cases, as it seemed to him the quickest way of clearing up the joint condition. When vasostomy was contemplated it was essential to put the patient to bed for at least three days; a week in bed was better. There was a temptation, especially in America, to do the operation in out-patient departments and under local anæsthesia, allowing the patients to walk. In Mr. Kidd's opinion that was a mistake. And during the days that the patient remained in hospital posterior irrigation should be carried out. Pyuria and haze in the urine should not cause discouragement; they might result either from chemical irritation or from secondary infections. The operation was more difficult under local than under general anæsthesia, at least at first. When he did it in 1923 he left the vas exposed, but he had discontinued that, as it was difficult to get a second or a third wash through.

The operation involved some risks, but they were not common. If the vas was not carefully stitched up a leakage of colloid silver would occur, and the consequent irritation might result in the formation of a stricture at the site of puncture. A real stricture, if occurring on both sides, might mean sterility. Out of his 50 cases complaint of sterility had been made in only one case, and Mr. Kidd felt convinced that the man was sterile before the operation was done; certainly he was not a father. Perhaps it was better to puncture the vas with a needle, and not to cut it at all.

Discussion.

Mr. J. F. PEART said he had done vasostomy only twice, the last time a year ago, and in both cases the results had been dramatically good. The first patient had had gonorrhœa only seven days, but even then epididymitis was evident. The condition cleared up completely three days after operation. A month later the patient gave himself a severe alcoholic test, but no further signs of the disease appeared. The second case was a more serious one, as the patient had been acutely ill with gonorrhœa for three or four weeks before he was seen. The temperature was 101° F., and he had very acute epididymitis. When Mr. Peart was called in, he evacuated the epididymitis and injected the silver only on the affected side. On the day following the rise of temperature the discharge and the pain had disappeared. When seen a month later there were no gonococci. But he used, for both his cases, a much stronger silver solution than Mr. Kidd employed—namely, 20 per cent.

Mr. F. FOWLER WARD spoke of having done vasostomy many times for chronic gonorrhœa. He was convinced of the value of the operation.

Mr. HUGH LETT thought the form of silver used possessed considerable power of penetration, and remained for some time in contact with the vesicles. The danger, as with every new method, was lest it should be used indiscriminately for every kind of case of the disease. A further real danger was that when the operation was done on both sides a stricture might occur on both sides. That alone would deter him from doing it except in very severe cases. If limited to the suitable type of case he regarded the operation as a very distinct advance.

Mr. V. E. LLOYD spoke of his experiments in injecting methylene-blue in the cadaver, remarking that he was led by these to conclude that some of the cases which reacted so well to silver preparations during life were infections of the ampulla of the vas rather than of the vesicles themselves.

Mr. G. E. NELIGAN said he had done vasostomy in three cases of chronic gonococcal infection of vesicles and prostate which did not yield to other forms of treatment. He deprecated doing it on any but carefully selected cases. He discussed the modus operandi of the silver preparation, and expressed some doubt that the injection described could directly cure epididymal orchitis.

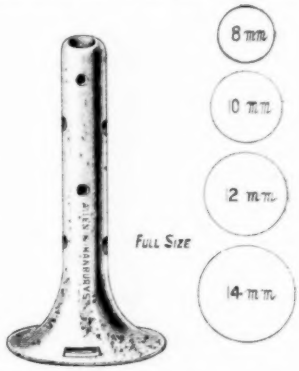
Mr. A. H. HARKNESS said that cases of acute posterior urethritis could usually be checked by giving local irrigations for 48 hours, followed by large doses of sandalwood oil.—Mr. JOHN ADAMS asked how it was considered that cure of joint conditions was so quickly brought about by this treatment.—Dr. B. B. SHARP said he would hesitate to employ the operation except for chronic relapsing vesiculitis, which often caused despair.—Dr. E. G. FFRENCH spoke of quick cures following vasostomy. Had this operation been known and practised during the war, many men could have been returned to the line weeks before they were sent.

Mr. KIDD, in his reply, said he was convinced that the arthritis in these cases was due to vesiculitis, and soon after the vesicles were empty the joint condition cleared up.

New Inventions.

DYSMENORRHŒA TUBES.

A DILATATION of the cervix for dysmenorrhœa gives freedom from pain of the spasmodic type for only 12 to 14 months, as a rule. Stems have been used to ensure prolonged dilatation at the time of operation and are inserted for four to five days. Their use lengthens the time of freedom from recurrence of the pain. It was thought that the nest of stems, graduated to suit different sizes of uteri here illustrated, would be an improvement. They are silver electroplated on brass and of four sizes, 8, 10, 12, 14, corresponding to the sizes of Hegar's dilators. They are hollow, rounded at the upper end, and the wall of the tube is perforated with small holes. The base has two holes for the insertion of a withdrawal tape. They are long enough to occupy the uterine cavity and so straighten an acute antiflexion of the corpus uteri. The cervix and body of the uterus are dilated to the extent desired, and a stem the size smaller is inserted after steadying and exposing the cervical canal by vulsellæ on the anterior and posterior lips.



A nest of four of these is made and supplied by Messrs. Allen and Hanburys, Limited, Wigmore-street, London, W. 1.

W. MCKIM H. MCCULLAGH, M.B., B.Ch. Belf., F.R.C.S. Eng.

Reviews and Notices of Books.

FRACTURES AND DISLOCATIONS.

Immediate Management, After-care and Convalescent Treatment, with Special Reference to the Conservation and Restoration of Function. Second edition, revised. By PHILIP D. WILSON, A.B., M.D., F.A.C.S., Instructor in Orthopædic Surgery, Harvard Medical School; and WILLIAM A. COCHRANE, M.B., Ch.B., F.R.C.S. Edin., University Tutor in Clinical Surgery, University of Edinburgh. London: J. B. Lippincott Company. 1928. Pp. 789. 45*s*.

THIS new edition of a work already well known has been brought thoroughly up to date by the inclusion of new methods and illustrations, and constitutes a worthy monument to the labours of the fracture service of the Massachusetts General Hospital. Containing, as it does, 1029 illustrations, all of them apt and admirably reproduced, it puts the subject of fractures and dislocations before the reader in a most attractive form. What a relief it is to find authors with the courage to discard illustrations and descriptions of time-honoured splints of bygone ages which still occupy space in our text-books, in our hospital splint stores, and even on our examiners' tables! Instead of these we are given admirable accounts of the use and application of methods of which the value has been proved by experiences of the war and the post-war period. The mechanism and anatomy of the various fractures are clearly described, and the appropriate means of reduction and fixation are detailed, but we feel that with the material on which the authors are able to draw more attention could with advantage be given to prognosis, a side of fracture work so important to the patient and so troublesome to the surgeon. The book is intended to meet the needs of the general practitioner, but we doubt whether many practitioners would be justified in attempting many of the methods described. The authors give to open operation in simple fractures rather grudging recognition. The advice that "when metal plates, screws or bands are used it is advisable in all such instances to remove them at a later period when union has been obtained" is surprising. The reason given—"that the presence of such foreign bodies in contact with bone is apt to be harmful in the long run, and may determine the development of a localised osteomyelitis or weaken the bone to such an extent as to result in fracture"—would place the technique of any less eminent surgeons than the authors under suspicion.

Minor defects such as these only serve to emphasise the excellence of the work as a whole; it is one which all who have to deal with fractures will find invaluable. It is difficult to know whether the publishers are to be more congratulated on the reproduction of the illustrations or the authors on their selection, but the result makes one of the most readable works on fractures with which we are acquainted.

IMPERATIVE TRAUMATIC SURGERY.

With Special Reference to After-care and Prognosis. By C. R. G. FORRESTER, M.D., F.A.C.S., Consultant, Teaching Staff, Illinois Post-Graduate School, Laboratory of Surgical Technique, Chicago. New York: Paul B. Hoeber, Inc. 1929. Pp. 464. $10.00.

THE author explains that he has chosen his title as being more descriptive than the previously contemplated one of "Industrial Surgery." We might have forgiven, while still regretting, his second thoughts, but when we find him referring throughout his work to "the traumatic surgeon" and "traumatic surgery," and using the expression "surgically compounding a fracture" in reference to the use of the Steinman pin the effect is definitely irritating. The book itself deals mainly with the treatment of fractures and nerve injuries, and embodies Dr. Forrester's experience of 26 years devoted to this branch of surgery. The advice given as to treatment is clearly expressed, and considerable attention is paid to the prognosis of the various injuries, a matter of great importance in industrial accidents. On the whole the author employs a longer period of immobilisation than is usual in this country, but this is probably due to the type of patient with whom he is dealing. He shows considerable ingenuity in the methods he employs, and his results, which are presented with admirable candour, do great credit to the thoroughness of his work. The book is well illustrated and printed, with the exception of the reproductions of the author's fracture cards. These, of which some 70 are given, are far too small to be read without considerable discomfort, and while no doubt excellent as case sheets, it seems doubtful whether they are necessary in the presentation of details of cases in a work of this kind. We hope that Dr. Forrester, encouraged by the results of his first essay in authorship, will continue to write on surgical subjects; but we trust he will in future refrain from referring to himself or any other as a "traumatic surgeon."

A GRAPHIC GUIDE TO ELEMENTARY SURGERY.

By Prof. Dr. TH. NAEGELI, Bonn. Translated by J. SNOWMAN, M.D., M.R.C.P., with an introduction by Dr. C. GARRÉ, Bonn. London: John Bale, Sons and Danielsson, Ltd. 1929. Pp. 205. 12*s*. 6*d*.

THE object of this book is to present an introduction to surgery in pictorial form, with simple illustrations as the main feature, and the text reduced to a minimum. With such an object every teacher must be in sympathy, but the present volume scarcely attains its end. Upon the title-page we are informed that the book contains 322 illustrations (mostly coloured), but the illustrations are diagrams (of the utility of some of which we have grave doubts), and the colour consists in a crude use of red, yellow, and blue to emphasise points in the diagrams. The text is more satisfactory than the illustrations and constitutes an introduction to elementary surgery on orthodox lines. The translation is performed with Dr. Snowman's usual facility, but we doubt whether this book is likely to find favour with students in this country.

ELEMENTARY MEDICINE.

Aids to Medicine. Fourth edition. By JAMES L. LIVINGSTONE, M.D., M.R.C.P. Lond., Junior Physician, King's College Hospital, London. London: Baillière, Tindall and Cox. 1929. Pp. 414. 5*s*.

Dr. Livingstone has succeeded in enclosing a surprising number of the medical facts that the student requires for qualification within the space of 414 pages. To decide what to insert and what to omit and to lay due and proportionate stress on individual diseases in such a small volume must have been a difficult task, and on the whole it has been well accomplished. There are some points to criticise. The Schick reaction is not mentioned. If adherent pericardium deserves one page, coronary thrombosis deserves more than four lines. The subject of gastric ulcer is introduced as follows: "The simple perforating ulcer of the stomach or duodenum occurs most commonly in girls between the ages of 15 and 25. . . . Predisposing features are chlorosis, dyspepsia, and constipation." The ordinary chronic ulcer is surely commoner in men, while the acute ulcer is not here described. The leukæmias are divided into three groups, the one acute form being described as having a white blood count "from 2000–50,000 almost entirely of the mononuclear variety—probably of myeloblastic origin." Although the acute forms are rare, we cannot see any justification in grouping acute lymphatic and acute myeloid leukæmia as one disease. Spinal cord tumours occupy 12 lines. More space

could well have been given here, for a correct diagnosis may mean much more to the patient than in such conditions as the muscular myopathies which are given fair prominence. A chapter is devoted to a synopsis of the more common skin diseases.

The book is clearly and concisely written, and the treatment of conditions such as diabetes, pernicious anæmia, and peptic ulcer are supplied in a just and up-to-date manner. To those students who are accustomed to occupy themselves with a small book a week or so before an examination this one can be recommended.

Practice of Medicine. A Manual for Students and Practitioners. Fifth revised edition. By HUGHES DAYTON, M.D., Consulting Physician to the United Hospital, Postilaster, New York. Philadelphia: Lea and Febiger. 1928. Pp. 340. $2.25.

THIS edition has been revised and brought up to date. Additions include an outline of the Dick test in scarlet fever with some remarks on the use of serum in prophylaxis and treatment and a brief account of the use of insulin in diabetes mellitus. Descriptions of the more common affections of the upper respiratory and digestive tracts, which had previously been omitted for lack of space, have now been added. The book contains much essential information required by the student revising for a qualifying examination, and has the additional advantage that it is small enough to fit easily in the pocket, while the print is large and clear.

Elementary Medicine in Terms of Physiology. An Introduction to Clinical Work. By D. W. CARMALT JONES, M.A., M.D. Oxf., F.R.C.P. Lond., Professor of Systematic Medicine, University of Otago, N.Z.; Physician, Dunedin Hospital; Consulting Physician, Westminster Hospital. London: H. K. Lewis and Co., Ltd. 1929. Pp. 364. 12*s.* 6*d.*

ONE of the most critical periods in the career of a medical student is the time when he first begins his clinical work. Up to that period his energies have been chiefly devoted to the study of anatomy and physiology, physics and chemistry, only too often under the tuition of those whose interests in the practical problems of medicine are slight. When he goes into the wards the position is abruptly reversed. He is suddenly confronted with the problems of disease, often by teachers whose physiological interest and knowledge has been largely submerged in the study of pathological processes and symptoms. Because of this unfortunate arrangement the continuity of the medical curriculum may be lost, and also much of the knowledge painfully acquired during the first two or three years of the curriculum. Dr. Carmalt Jones has recognised this chasm and has attempted to bridge it in this book by building up the principles of medicine for the student on a foundation of physiology. The scope of the work is limited to the recognition of organic disease, for, as the author points out, the practical questions of treatment and prognosis and the scientific one of ætiology belong to a later stage in the student's career.

The book opens with a brief outline of the causes of disease, and this is followed by a short account of the methods of examination of the various systems. The common disease syndromes are then dealt with according to systems. Throughout the book the effect of pathological changes on the normal physiological processes are made the basis of the teaching. Explanations are in simple language, while only such details of pathology and bacteriology as are necessary for understanding a disease are included, and there is no discussion of ultimate ætiology. Naturally this method has involved arbitrary limitations in many directions. There is, however, much in the book which should help the medical student to make his physiology the basis of his medicine rather than, as it so often is now, a prelude which appears to bear no relation to the theme which follows it.

THROMBOSIS AND PHLEBITIS.

Phlébites, Thromboses et Embolies, Post-opératoires. By Dr. J. DUCUING, Professeur Agrégé, Faculté de Médecine, Toulouse, France. Paris: Masson et Cie. 1929. Pp. 478. Fr.60.

THIS book is a comprehensive review of the whole subject of venous thrombosis and phlebitis, particular stress being laid on post-operative conditions. All types of thrombosis and phlebitis are dealt with from the pathological and clinical sides. There are chapters on the anatomy of the veins most commonly involved, the pathological changes underlying thrombosis, and the experiments performed by the author. Treatment, including prophylactic measures, is fully discussed. Dr. Ducuing has evidently studied his cases from the point of view of thrombosis more minutely than most surgeons, for he gives a much higher percentage incidence of clinically manifest thrombosis than any other author, and, moreover, believes that embolism frequently occurs where even the most meticulous examination can reveal no evidence of thrombosis. Dr. Ducuing sets out in detail the signs and symptoms on which his diagnoses are based, and gives case records to illustrate his points. Of particular interest are his investigations into the flow of blood by means of radiological observation of lipiodol injected into veins; on the basis of these investigations he attributes an important rôle in the production of thrombosis to venous spasm. His statistics are not always convincing. For instance, the total incidence of embolism occurring at various ages is stated, but as it is in no way related to the number of operations performed at these ages, an erroneous impression is given.

The book is not easy to read, for its continuity is much broken up with headings and subheadings, and the sequence of thought is not evenly maintained. The author has, however, summarised an exhaustive survey of the literature on all aspects of the question and has brought to his subject a wide clinical experience, a personal enthusiasm, and an impartial judgment. The presence of an extensive bibliography and a full index deserves record, since this feature is too often lacking in French monographs.

TRIAL OF JOHN DONALD MERRETT.

Edited by WILLIAM ROUGHEAD. Edinburgh and London: W. Hodge and Co. 1929. Pp. 326. 10*s.* 6*d.*

John Donald Merrett, a young man about 19 years old, educated at an English public school and afterwards at Edinburgh University, was tried in Edinburgh in 1927 on the two charges of having murdered his mother and of having uttered forged cheques upon her banking account. Mrs. Merrett had died of a revolver bullet wound received at a time when she was alone in the room with her son. He came out and called to the servant that his mother had shot herself. Mrs. Merrett was taken unconscious to the Royal Infirmary at Edinburgh, where her son explained her conduct as due to "money matters." In these circumstances she was treated as an attempted suicide; she lived for a fortnight, and until a few days before her death her mind was perfectly clear; but, as she was never told what was the matter with her, she was naturally at a loss to understand what had occurred. The bullet entered the right ear and lodged behind the nose. The late Prof. Harvey Littlejohn's post-mortem conclusion was that the position of the wound was consistent with suicide; "there is some difficulty in attributing it to accident, although such a view cannot be wholly excluded." Several months later the suspicion of murder began to gain ground, especially as it became clear that young Merrett had forged his mother's signature on some 29 cheques. Prof. Littlejohn then revised his former opinion in a second report, in which he described the accidental discharge of the pistol or the intentional self-infliction of the wound as equally inconceivable

in view of the direction of the bullet, the position of the wound, and the absence of any blackening of the skin. At the trial much attention was given to the questions of the distance at which a pistol-shot would produce blackening, and whether the discoloration would be permanent or would be removed in washing the wound. In addition to firearms experts several medical witnesses dealt with these matters, Prof. Littlejohn and Prof. John Glaister as witnesses for the Crown, and Prof. G. M. Robertson and Sir Bernard Spilsbury on the other side. Merrett was found guilty of the forgery; on the murder charge there was a majority verdict of "not proven."

The case, which forms one of the Notable British Trials series, is edited with great competence and enthusiasm by Mr. William Roughead. As, however, he manages to convey a strong opinion upon the cause of Mrs. Merrett's death, the inclusion in that series of a trial which took place only two years ago seems open to criticism. A man who has been so recently acquitted of murder ought not so soon to be re-tried, either by journalists or historians.

COSMETICS.

Die Behandlung der kosmetischen Hautleiden. Second edition. By Prof. E. KROMAYER. Berlin: George Thieme. 1929. Pp. 124. R.M. 5·50.

THE art of cosmetics, by which is implied the correction of cutaneous stigmata, not serious in themselves but obnoxious to their victims, is almost ignored by the profession in this country. The dermatologist, whose knowledge of the fundamentals of his science would seem to mark him as the natural and legitimate practitioner in this field, is often too busy in the domain of disease to trouble himself with blemishes, and has no desire to run the risk of earning the opprobrious title of beauty specialist. The unfortunate patient is therefore frequently driven to seek the aid of the unqualified quack or the beauty-parlour, and is lucky if he escapes their clutches in a condition in statu quo ante, both physically and as regards the pocket. It is curious how difficult it is to erase a label. In Germany, the names of Max Joseph and Kromayer have been honoured as cosmetic specialists for nearly half a century, and both of them number among their clientèle many English patients, to whom it would never occur that in this country their benefactor would probably have succumbed long since in the slough of professional suspicion and contempt. It is high time that cosmetics should be placed on a reputable footing, and receive official recognition. She is, after all, the younger sister of dermatology, and no Cinderella at that, for success in this field demands at least as much medical knowledge, and even more manual dexterity, than is considered essential in the elder relation. To any beginner we can strongly recommend Kromayer's manual. He is one of the pioneers of actinotherapy, the water-cooled mercury-vapour lamp that is called by his name was invented no less than 22 years ago, and in its own sphere still has no competitors. If that had been his sole contribution to science his name would live, for the instrument can be used, as a brief perusal will show, in many unsuspected ways. Its well-known attributes are not unduly stressed by the author, but we cannot too strongly emphasise that it is superior to X rays in one most important particular—it is difficult, nay almost impossible, to do lasting damage—an issue that is not always remembered when repeated radiotherapy is undertaken.

A description of the uses and indications of the author's ring-knives and burrs (borrowed from dentistry) is followed by a brief but very useful essay on the principles underlying the treatment of dry and greasy skins; this section contains some excellent and easily memorised formulæ. In the next chapter on corns, and that succeeding on boils, the author describes the uses of ignipuncture, a rather neglected procedure in these days of radium, and there follows a detailed treatise on the ætiology and treatment of acne, than which none better could have been written. The treatment of rosacea and its associated nasal hyperæmia by means of compression application of the "blue-filtered" Kromayer light is worthy of study by every dermatologist, and in no other work that is known to us has a rational treatment of "large pores" been attempted. The remaining chapters are devoted to a study of such common stigmata as lichen pilaris, hyperidrosis—with the author's own method of using X rays (a dangerous expedient in unskilled hands for this affection)—seborrhœa, the various alopecias, and hypertrichosis. The methods advocated for the latter vary according to the size and inclination of the individual hairs. For those emerging at right angles to the surface and of coarse texture, the 0·8 mm. ring-knife is recommended. This is rotated evenly round shaft and root-sheath, thus dividing the epidermal connexions, and allowing easy withdrawal from the loosely connected fibres of the subcutaneous tissues. As the author writes: "The method does not seem to have gained many adherents" . . . it is nevertheless of good service in selected cases. Permanent epilation by X rays and some new claims by the younger generation of radiotherapists are critically examined, and rightly condemned. There is no safe X ray method for the permanent cure of hypertrichosis yet designed; and electrolysis is still the best and safest procedure when skilfully conducted. The two sections on this important subject will repay close study. It will be news to most experts that it was Kromayer who designed the now universally employed "insulated" needle.

Equally wise and valuable are the concluding chapters on the eradication of the almost inexhaustible varieties of nævi, vascular and otherwise, by alcohol injections, radium, CO_2 snow, ignipuncture, each according to its size and texture. And yet, including, as it does, a really vast amount of information, this little paper-covered volume consists only of 124 pages.

A general index, and one relating to the author's unique contributions to the subject, conclude an eminently readable and scientific treatise.

COMPARATIVE PATHOLOGY.

Lectures on Plant Pathology and Physiology in Relation to Man. By L. O. KUNKEL, H. C. COWLES, G. H. COONO, E. C. STAKMAN, H. H. WHETZEL, and W. J. V. OSTERHOUT. London and Philadelphia: W. B. Saunders Company, Ltd. 1928. Pp. 207. With 16 figures. 12*s*.

THESE lectures, given under the auspices of the Mayo Foundation, bring out very clearly the specialisation of racial susceptibility and resistance of plants to parasites and the corresponding variations in the aggressive qualities of fungi. Animal pathologists know of the phenomena but they appear much more plainly in plants, where constitution is evidently of paramount importance. It is also interesting to note that students of parasitic fungi are getting much help in classifying their species and varieties from serological methods.

PHYSIOLOGY.

Homoiothermism: the Origin of Warm-blooded Vertebrates. By A. S. PEARSE and F. G. HALL. New York: John Wiley and Sons. 1928. Pp. 119. 10*s*.

THE development of warm-bloodedness is a very interesting chapter in evolutionary physiology. The authors of this book have lost a good opportunity and give us only a superficial and disappointing discussion of the subject, singularly deficient in data. The bibliography, which occupies more than a dozen pages, contains no reference to H. M. Vernon's essay in *Science Progress* for 1898 (vol. vii., p. 378) which the authors would do well to read.

THE LANCET.

LONDON: SATURDAY, MAY 25, 1929.

LESSONS OF THE CLEVELAND DISASTER.

THE terrible catastrophe on Wednesday of last week at the Cleveland Clinic Hospital, Ohio, when a hundred or more persons, including members of the medical and nursing staff, lost their lives, has illustrated the potential danger of storage of X ray films on a large scale. This hospital was founded in 1891 by a group of Cleveland physicians at their own cost in order to investigate more fully the clinical problems with which they were faced. It was therefore natural that the basement should contain a larger collection of X ray films than would be found in a less well-equipped hospital, and there is a further suggestion that an equally well-equipped laboratory added fuel and noxious products to the flames once these had got out of control. Dr. JOHN PHILLIPS, one of the three founders, himself perished in the fire from which his chief, Dr. G. W. CRILE, escaped only with difficulty. No authoritative account of the disaster has yet reached us, but it seems that after an explosion in the basement of the hospital the products of combustion invaded the rest of the building with results reminiscent of a gas attack in warfare. Although the actual origin of the explosion or fire remains to be cleared up, and may, in fact, be difficult accurately to ascertain since none of those present is alive to tell the story, it is assumed by experts here that, however originated, the lethal agency was the partial combustion of celluloid film. Various gaseous poisons have been mentioned, but chemists here will agree with the Washington Chemical Warfare Service in believing that the deadly brown gas evolved was nitrogen dioxide rather than bromine. The latter, however, cannot be ruled out where quantities of silver bromide were present in what became to all intents a reducing furnace, nor is the suggestion of hydrocyanic gas untenable in the same conditions. But apart from these possibilities more than sufficient is unhappily already known of the higher oxides of nitrogen in giving rise to a rapidly fatal pulmonary œdema, which occurs the more readily in that they are actually less irrespirable than the halogen gases.

The danger from the inflammability of celluloid has proved a serious drawback to the employment of this substance ever since it was discovered in 1869 by the Brothers HYATT, of Newark, U.S.A. The fact that it is a product of gelatin, nitrocellulose, and camphor is itself a sufficient indication of danger, but in practice celluloid, while highly inflammable, is non-explosive under any conditions to which it may be subjected in the work of cutting, turning, or moulding, or indeed under any normal conditions. Ever since the London disaster of 1912 in Moorlane, when nine girls lost their lives in the flames of a fire started by celluloid, and a Departmental Committee was appointed to inquire and report into the precautions necessary in its handling and storage, research has never flagged into the possibility of obtaining a less inflammable material with equally useful properties. Some success has been achieved, although the addition of extraneous material proved futile by diminishing the homogeneity of the product so essential for photographic purposes. For the preparation of plastic splints, a safe form of celluloid has long been in use, the acetate of cellulose with which these splints are covered, in conjunction with plasticisers, rendering the material practically non-inflammable. But while the dangers of the use of celluloid in the photographic and cinematographic industries have been constantly before the public mind and have resulted in strict official regulations, it is a fact that the X ray film has in no single instance proved to be a source of accident in this country. During the last 25 years the most serious hospital fire was that which occurred in 1923 at the Highbury Pensions Hospital, Birmingham, with the loss of two lives. This outbreak caused the management of King Edward's Hospital Fund to issue a revised memorandum of precautions against fire, but although many possible sources of danger are mentioned the X ray film is not one of them. Seven years ago a Protection Committee was formed, as the result of coöperative action between the British Institute of Radiology and other interested bodies, in order to diminish the risks of the X ray room, but, at that time and since, these risks have been primarily those of sudden danger to life from high-tension current and of slow biological risk from prolonged exposure of tissues to rays of short wave-length.

The modern X ray room itself contains little or nothing of an inflammable nature. The insulating oil used in the transformers, switches, and circuit-breakers has a flash-point of 170° C., and oil of this safe kind has practically replaced the use of coal gas as a dielectric. There is no accumulation of unexposed celluloid film in the X ray room, for it obviously cannot be left about except in a thickly leaded container. As to the inflammability of the films in common use, it is true that they will burn fiercely when actually set alight, but it requires flame to do so, and a mere glowing cigarette-end will not start the combustion. The filing cabinets where the films are stored are remote from the rooms in which current is generated or used, and where films are stored on a large scale arrangements are made for the fireproofing of the room itself. This at all events is the practice in institutions where the risk has been most carefully envisaged and provided against; should there have been a certain added element of happy chance in the almost universal immunity from accident, no doubt the Cleveland disaster will lead to a screwing up of precautions to the level of the best.

THE RIGHT POLICY IN LEPROSY.

THE British Empire Leprosy Relief Association states boldly that its object is to rid the Empire of leprosy. That such an end should be regarded as feasible is a measure of the success attending the therapy introduced by Sir LEONARD ROGERS as a result of his leprosy work in Calcutta over a decade ago. In the latest issue of the Association's quarterly journal[1] the Editor discusses this new and confident outlook which has developed during the last ten years. We know well what happened to the leper of old: "without the camp shall his habitation be." In policy this meant: get rid of the leper; segregate him strictly, and keep him close until he dies. In consequence most cases were hidden, and isolation, when it came at all, too often came too late to prevent him spreading his disease. The new injunction—get rid of leprosy—is altogether different. It works out, and successfully, in the provision of clinic centres where expert medical officers may give lepers the modern treatment which, it has been amply demonstrated, will

[1] Leprosy Notes. No. 5. April, 1929. The British Empire Leprosy Relief Association, 24, Cavendish-square, London, W. 1.

render contagious cases non-contagious, and prevent the early non-contagious case from becoming a danger to the community. Wherever these treatment centres are established, their success is quickly proved and advertised by the large numbers of hitherto hidden lepers who eagerly seek treatment. The treatment has indeed brought in the era when the leper declares himself a leper.

This success depends on accurate treatment after accurate diagnosis—and the importance of the latter can be understood when we realise how potential as a focus of infection is the very early case, not yet become contagious, comparatively difficult to recognise, and yet easiest of all to treat successfully. The medical officers staffing these clinics must therefore be specially trained in their work, and the Association has made financial grants to medical men, so that they shall receive this training, notably at the Leprosy Clinic under Dr. ERNEST MUIR at the Calcutta School of Tropical Medicine. Sir LEONARD ROGERS records that by 1927 over a hundred medical men, mostly from India, but some from Africa, Greece, and the West Indies, had received instruction in leprosy work in Calcutta and, since that time, a great many more have had this advantage. There is now a second teaching centre at the leprosy clinic at Dichpali in Southern India. Numbers of men trained at these places are already at work in clinics in other parts of India, new centres for the treatment of leprosy and the dissemination of accurate knowledge having thus budded off from the parent institutions. The leper settlements of Trinidad and of British Guiana are clearly centres ready at hand for the training of leprosy workers for the West Indies; and the leper colony at Kuala Lumpur for those for Malaya. Whole-time experts are now at work in Nigeria, the Gold Coast, and Uganda; they have the material for training needed additional workers in those areas, and many lepers are now voluntarily coming forward for treatment in these African colonies. Their demand must be adequately met. And apart from the expert medical officer at the leprosy clinic, the general medical practitioner can render valuable aid by the recognition of early cases and by treating leprosy where there is no special treatment centre. Doubtless, with the multiplication of leprosy clinics in the tropics, he will increase his knowledge and competency in leprosy by attending the work of a clinic in his province.

Dr. ANDREW BALFOUR points out that the bacteriology and morbid anatomy of leprosy are taught to undergraduates in the medical schools in this country, and especially to post-graduates at the schools of tropical medicine. Furthermore, in London, at the Wellcome Museum of Medical Science, there is a fine graphic exposition of the disease, and a leprosy section is being prepared for the new museum of the London School of Hygiene and Tropical Medicine which will thoroughly illustrate every aspect of the leprosy problem. But even at the schools of tropical medicine opportunities for the clinical study of leprosy are rare in England. No use for teaching purpose is made, or can be made, of the lepers—few in number—in the Homes of St. Giles, in Essex. It would be well, therefore, in view of the great importance of this among tropical diseases, that in any hospital in this country devoted to tropical diseases there should be a special ward for the study and treatment of lepers, and for instruction of post-graduates in the clinical aspects of the disease. At present the rare clinical material in this country is wasted, but such a treatment ward might well attract cases which would otherwise go undetected.

DRUNK IN THE ABSTRACT.

THE standardisation of drunkenness is an ancient difficulty. A medical witness stated lately at Marylebone police-court that the defendant was drunk and unfit to be in charge of a motor-car. The magistrate, Mr. HAY HALKETT, thereupon invited the witness to disregard the defendant's relation to the motor-car. "You have nothing to do with the car," said Mr. HALKETT, "all you have to say is to answer whether he was drunk." If a witness let his mind dwell on the motor-car, continued the magistrate, he was apt to slide into the dangerous theory that, because a car was involved, therefore it was an offence for a man half drunk to be in charge of it; the man must be so drunk as to be justifiably arrested in the street for disorderly conduct. Medical witnesses, therefore, must simply ask themselves the usual questions by which drunkenness is tested. Could the accused coördinate his faculties? Could he speak properly? Was there anything he could not do which he could do ordinarily? These remarks were the more significant because the law is inclined to ignore drunkenness unless the accused is also riotous or disorderly or is engaged at the moment in some particular employment. Thus it is an offence to be drunk while acting as a pilot or as the master of a ship, or as a railway employee, or a postal official, or while in charge of cattle, or of a child in a highway or public place, or while in possession of loaded firearms. Earlier enactments make it also an offence to be drunk in charge of a steam engine and of various carriages, and now, under Section 40 of the Criminal Justice Act of 1925, it is an offence to be drunk while in charge on any highway or other public place of any mechanically propelled vehicle.

In spite of the learned magistrate's direction it is, we think, a little hard for a medical witness to concentrate upon the presence or absence of a kind of abstract drunkenness without taking into account the defendant's relation to his environment. A man may be judged drunk by the way he behaves with his car. Another element in the situation is a certain discrepancy between the medical estimate of drunkenness and the police estimate. A man may be drunk, but if his condition is not too provocative—if, in fact, he is not *very* drunk—he may well find his unsteady way homeward without arrest. We seem to be no nearer to a simple universal standard of drunkenness which witnesses can easily apply and magistrates can accept. It would probably be easier for the police-surgeon if his task were merely to say whether or no the motorist had indulged in alcohol to such an extent as to unfit him for driving. This is what the law has enacted for the pilots and crews of aircraft. The Air Navigation Order penalises them if they place themselves under the influence of any narcotic sedative or stimulant drug so as to become unfit for their duties in respect of the aircraft. Perhaps some day the law will enact a similar penalty for the motorist who, without being fully drunk, is under the influence of alcohol. If proof of such influence is easier than proof of drunkenness, the magistrates may welcome such a change in the law. Even under the present system, out of a total 120,629 motoring offences, 926 persons were found "drunk in charge" of a car during the latter half of last year. It is understood that the metropolitan stipendiary magistrates have recently voted in favour of retaining the speed limit partly on the ground that excessive speed, though not necessarily a cause of accidents, is a fact more easily proved than mere dangerous driving. At any moment public opinion may be aroused by the appalling loss of life due to traffic accidents. The

latest statistics show that something like 6000 people are killed on our roads in a year. The only redeeming feature of this holocaust is the fact, which the figures seem to support, that injuries to children are diminishing. Is the youngest generation evolving a protective caution or nimbleness in traffic which the older pedestrians cannot acquire ?

Annotations.

"Ne quid nimis."

THE ROYAL SOCIETY CONVERSAZIONE.

A CONVERSAZIONE is, in the terms of the lexicographer, a soirée given by a learned society. In the case of the Royal Society it is this and something more—namely, a cross-section for public view of the current of modern scientific thought. The conversazione of May 15th was memorable for the cinematograph demonstration of tissue cultures by Dr. R. G. Canti. The film has been exhibited before, but it gains by repetition. The growth of periosteum, choroid, and nervous tissue of chick embryos is shown by photographs taken at regular intervals and accelerated as much as 900 times. The result ranks among the most ingenious and successful attempts to depict the processes of reproduction and of growth. From a purely technical point of view the film is nearly perfect, and to medical men it gives a sense of contact with the familiar, yet elusive, phenomena of repair and new growth which is awe-inspiring. Fibroblasts are seen to grow, as it were, with deliberation from a tiny point of tissue, and around them there hover, like bees among flowers, an ever-increasing colony of wandering cells. With a higher power of magnification, nuclei are seen to divide into chromosomes, the dividing cell struggles for a few moments, then splits in twain, each cell wandering quite definitely away from its sister. Scarcely for a moment is any cell at rest; the sensation of impermanence is oppressive. This aspect is exaggerated under dark-ground illumination; the mitochondria within the cell are in even more incessant movement, themselves dividing and threading their way through the cell-substance like silver wires. The wandering cells phagocytose dead and dying tissue, leaping on their components like spiders on flies, and their appetite seems infinite, though their size remains the same. To the uninitiated, malignant tissue appears to behave much in the same way as the normal. If the medical student's education were to include the demonstration of such films as these the dry bones of pathology would spring into new and prolific life.

Tissue culture was conspicuous among the exhibits, since the action of radium on mitosis, the delayed lethal dose of radium, and the nature of microglia may all be studied by this means. The exhibit staged by the Strangeways Research Laboratory (Cambridge) indicated that the effect of low temperatures, and of radium on cell division, are very similar, allowing for the considerable lag in the effect of radium. Clinicians are familiar with this phenomenon in the treatment of myeloid leukæmia. Microglia was shown, from its behaviour in repair, and its power of vital staining, to belong to the reticulo-endothelial system. The Rothamsted study of insecticides was of great interest. Pyrethrum is the foundation of most commercial articles for domestic use. Its active principle, which has been isolated and analysed, is of simple structure, but it varies greatly in its effect on different species of insects. For many kinds of agricultural pests, however, its toxicity is many times as great as nicotine, which is taken as the standard. Efforts are being made to grow pyrethrum on a commercial scale in this country. The same institution showed many tropical plants used for the extraction of poisons for fishing. The powdered wood is thrown into the river, and the dead fish collected. It is of interest to note that, in places so far apart as British Guiana and the South Seas, the active principle of the wood is the same. Dr. H. Ettringham presented a beautiful series of models and sections of the scent-producing organs of insects. These are chiefly found in the male insect, and are used to excite or attract the female Cadder-flies, whose heads are less than one-fiftieth of an inch across, they have the most complex organs, sometimes shaped like miniature shaving-brushes, and covered by caps when not in use. The smell is usually imperceptible to man, and the nature of the organs is surmised from analogy. Dr. R. J. Ludford showed the relation of nerve-fibres to normal and malignant epithelium. In the latter there is a great proliferation of nerves, interpreted as an attempt at repair. The actual penetration of epithelium by nerve-endings is a point of great interest. Miss D. M. Cayley, of the John Innes Horticultural Institution, gave the answer to a problem which in the days of exorbitant prices for rare tulips was much discussed. Uniformly coloured tulips are apt to "break"—that is, to give rise to striped forms. The habit is now assumed to be due to a virus, transmissible by aphis bites, and to bear some analogy to the mosaic disease of tobacco plants. The graphic illustration of a sensory nerve impulse was shown by Mr. Bryan Matthews, now a Fellow of King's College, Cambridge. The potential change is one of 20 microvolts only, and lasts for 2/1000 of a second. Valve amplification is used to demonstrate it, the record being made with an oscillograph of a natural frequency of 6000 per second. Sensory impulses have been much studied by Prof. E. Adrian, whose influence is to be seen in this beautiful piece of work.

Other demonstrations in this remarkable collection included a method of tracing the direction and source of atmospherics in wireless telephony, fossils of considerable evolutionary interest, and a collection of insects, widely separated both geographically and phylogenetically, yet with markedly similar morphological details. The last-named exhibit was very suggestive in its indication that similar environments and functional demands create analogous and even monstrous forms wherever they operate. The general impression left by these demonstrations is that the biological sciences in England are in a healthy state. The application of the newest knowledge and most elaborate techniques to biological problems is flattering to the breadth of the biologist's horizon. Life, when its intricacies are too slow in their manifestations to be synthesised, are speeded up by the cinematograph; when too fast to be analysed, they are slowed down by the oscillograph. By means of radium the metamorphoses of nuclei are inhibited; the most beautiful optical devices and the most refined products of the dye-works are at the service of the histologist. The outcome of all this is a sensation that we have controlled life—to some extent; we have at least compelled it to run at our speed. Perhaps we can now take breath, and find out what it is all about. The Royal Society Conversazione is even more impressive in retrospect than in experience. The reach of man still exceeds his grasp; but his weapons of apprehension are to-day a matter of justifiable pride. The universe is too great and too small, it moves too fast and too slow, its voice is too loud and too small for our five senses; but we are beginning to translate it into their language.

THE AMENITIES OF ZÜRICH.

THE annual congress of the Royal Institute of Public Health was held at Zürich from May 15th to 20th under the presidency of Lord Meston, Chancellor of the University of Aberdeen. The visitors were given ample opportunity to see the sanitary arrangements of the city, of which certain peculiar features created considerable interest. The water-supply is derived from two sources, the lake, and springs in the Sihl and the Firzetal, about 30 kilometres

from the city. The daily average consumption by about 220,000 inhabitants is approximately 65,000 cub. met., the maximum 95,000, about 30,000 of which are obtained from the springs. The spring water is not treated; it supplies two of the four zones of distribution. The intake of water from the lake is at a point 375 metres from the shore and 29 metres below the surface; at this spot the lake is 50 metres deep. Pollution of the lake in the vicinity of the intake is avoided by connecting up the drains of neighbouring villages with the city sewers. The effluent from the city sewage works goes into the river which flows away from the lake. The water passes through a roughing filter put down in 1914; this takes out the algæ and reduces the organisms to 40–70 per c.cm. After passage through a slow sand filter (covered to prevent the growth of algæ) the maximum number of organisms in a cubic centimetre is 10. The water over the filter never freezes; in the coldest weather the mean temperature of the lake water is always several degrees above the freezing-point. It is not found necessary either to store or sterilise the water.

For a number of years the covered dustcart used at Zürich has been held up as worthy of wide imitation. Recently this has been improved, reduction having been made in the loading level; the height of the side is now only 148 cm., and thus the time and energy expended during the emptying of the bin into the cart has been considerably lessened. Economy is also effected by requiring the driver to help in the loading of the vehicle. Householders have been gradually persuaded to buy a dustbin of uniform pattern, sold in three sizes containing 22, 35, and 50 litres respectively; a subvention of about 3 francs was paid towards the cost by the city. Saving of time in loading has resulted from the use of the uniform bin, 120 being collected in the same time as 100 bins of irregular sizes. For economical reasons collection is not confined to the morning but takes place throughout the day. Horse transport is used in the older flat part of the city with its narrow streets and motor traction in the hilly outskirts. The refuse is burnt in a Heenan and Froude's destructor erected in duplicate, after separation of any iron materials, the emission of black smoke being diminished by the use of an electric device. The heat evolved is used to raise steam which produces electricity. Household refuse from nine adjacent villages is also consumed by the destructor. The streets of the city were noticeably clean and free from litter. Cremation is making considerable strides in Zürich; since 1925 there have been more cremations than burials. An excellent municipal swimming bath is provided along the lake side. Swimmers in Zürich are thus able to avoid all the disadvantages attached to artificial baths in the absence of adequate change or purification of the water. Altogether full use is made of the city's great natural advantages.

LIVER EXTRACT IN DERMATOLOGY.

THE discovery of an efficient antidote to the occasional toxic manifestations of salvarsan and bismuth is overdue, for evidently sodium thiosulphate is not of much value in the later stages. It is well known that in the large majority of cases the liver is the organ which chiefly suffers, and when the patient succumbs cloudy swelling or so-called acute atrophy are the usual post-mortem findings. Dr. B. Spiethoff[1] of Jena raises the important question of the protective rôle of liver extracts in diseases attributed to hepatic dysfunction, and informs us that his anticipations of their antidotal effect in salvarsan poisoning were not disappointed. In several cases (number unstated) of the severe forms of salvarsan dermatitis with high fever, and the much-dreaded complication of cutaneous abscesses, a rapid and noteworthy improvement seems to have set in within a few hours of administering liver. Spiethoff recommends intramuscular injections of a sterile aqueous extract (5 c.cm. = 5 g. liver) up to three weekly doses of 5-10 c.cm. being given for all acute and subacute cases, and for such as are unable for some reason to assimilate liver preparations by the mouth. He never observed intolerance to intramuscular extracts; thus two women with psoriasis developed urticaria when the extract was given by the mouth, although it was well tolerated by injection. He found the liver treatment useful, furthermore, in preventing or aborting a commencing salvarsan or bismuth dermatitis in children with the idiosyncrasy, and it enabled him to carry on the specific treatment pari passu. Since the number of organisms in cases of *Bacillus coli* bacilluria was scarcely influenced by the injections of liver extract, although there was simultaneous improvement of the general health, Spiethoff deduces tentatively that the action of the liver is antitoxic rather than bactericidal. In experiments on psoriasis during the last two years, he found that as long as liver extract is being given there is a definite inhibition of fresh lesions, although no influence on the established eruption is apparent. He suggests that there may be a hepatic factor or association in the production of psoriasis, for relapses and recrudescences are seen as soon as administration of the extract is discontinued.

[1] Münch. Med. Woch., April 5th, p. 577.

CENTENARY OF THOMAS YOUNG.

THIS month sees the centenary of the death of Thomas Young, of whom the late Dr. Howship Dickinson truly said that he was "the most comprehensive genius and greatest man of science who ever held the office of physician to St. George's, or indeed any other hospital." Young was born at Milverton, in Somerset, the eldest of ten children, of Quaker parentage, in the year 1773, and was thus in his fifty-sixth year when he died. As a child he was precocious, being able to read with considerable fluency by the time he was 2 years old. He started the study of Latin at the age of 6, and at 7 was sent to a boarding school near Bristol, and began, as he says himself, to be his own teacher. From 1782–86 he was at a school kept by a Mr. Thompson at Compton in Dorset, where, in addition to the ordinary classical curriculum, he read books on natural philosophy and some of Newton's works, with Martin's optics. He also learnt to draw, to turn on a lathe, and to use a quadrant in measuring altitudes. In 1792 he began the study of medicine at the Hunterian school in Great Windmill-street, and in the following year entered as a pupil at St. Bartholomew's Hospital. In that year, when only 20 years of age, his celebrated paper on the mechanism of the eye was read before the Royal Society, and for this paper he was elected F.R.S. in 1794. In 1802 he was elected Foreign Secretary of the Society, and in 1827 he was chosen one of the eight foreign associates of the Academy of Sciences at Paris, succeeding Volta.

Young had greater advantages than usually fall to the lot of an embryo medical man, for his uncle was the well-known Dr. Brocklesby, who left house, books, and a considerable sum of money to his nephew; but he also had a far more catholic education than most of his contemporaries, for he studied at Edinburgh, Göttingen, and Cambridge Universities, before beginning practice in Welbeck-street. It is not easy to summarise his scientific activities briefly. We may recall his work on the undulatory theory of light and the ingenious experiments on his own eyes which proved the presence of a considerable degree of lenticular astigmatism in his own person; and, of course, his investigation of colour vision. His work for the "Nautical Almanack" and the Board of Longitude, and that in connexion with life assurance, must be mentioned, whilst to the lay mind his research on Egyptian hieroglyphics, which was done independently of, and rather earlier than, that of Champollion, is even more interesting. His "Practical Nosology and Pharmacology," which appeared

in 1813, is an extremely learned work which will repay perusal by the curious to-day. The students at St. George's are reputed to have said of Young that he was a great philosopher but a bad physician. He was regarded by his medical contemporaries as a feeble practitioner, but the Apothecary (the "super house physician" of the day) is credited with the observation that a greater proportion of Dr. Young's patients were discharged "cured" than of those subjected to the more heroic treatment of his colleagues. The beautiful copy of his portrait by Sir Thomas Lawrence is one of the chief glories of the board room of St. George's Hospital.

Young was buried at Farnborough, in Kent, and a medallion with a tablet to his memory is in Westminster Abbey. From the inscription, which was composed by Hudson Gurney, we may quote the sentence, that he was "a man alike eminent in almost every department of human learning."

CONGENITAL VALVULAR OBSTRUCTION OF THE POSTERIOR URETHRA.

IN the April number of *Surgery, Gynecology, and Obstetrics* Dr. Hugh Young and Dr. Robert McKay, of Johns Hopkins Hospital, write on that comparatively rare condition, congenital valvular obstruction of the prostatic urethra. Although valvular obstruction of this kind was recognised 135 years ago, it received little attention until recently, partly because it was only discovered at autopsy or accidentally during the course of an operation. Probably the first time it was observed through a cystoscope was in 1912, and the first successful operation is said to be that recorded by Young himself in 1913. Since then more notice has been taken of the condition in urological literature. In their present paper Young and McKay have collected reports of 21 cases of congenital valvular obstruction of the posterior urethra seen at the Brady Urological Institute, and besides these have collected from the literature 41 additional cases, of which 12 were treated by operation. The symptoms attributable to valves in the posterior urethra may be grouped under two headings—namely: (1) those brought about by obstruction to urination, and (2) those resulting from so-called back-pressure upon the kidneys, producing renal damage and insufficiency, and finally uræmia. The patient is always a child, and the symptoms of the first category may be difficult to elicit. On careful questioning, however, a history of difficult micturition since birth, with delay in starting the act and a tendency towards dribbling at the end, is usually obtained. Not infrequently there is incontinence both by day and night, this being of the paradoxical type, due to overflow from a distended bladder which is never quite emptied. The symptoms of the second category are those of chronic uræmia and may simulate chronic diffuse nephritis or polycystic kidneys. The diagnosis rests on posterior urethroscopy, cystoscopy, and radiography after distension of the renal pelvis, ureter, and bladder with sodium iodide. A cystogram will always show dilatation of the vesical orifice and a continuation of the opaque medium down the posterior urethra to the site of the valves, producing a typical tunnel-shaped end to the cystogram. Careful urethroscopic examination of the posterior urethra will reveal three types of congenital valves in the neighbourhood of the verumontanum—a double bifurcating valve springing from the distal portion of the verumontanum, a bifurcated valve extending from its proximal portion, or an iris-shaped valve lying above the verumontanum. It may be recalled that a case corresponding to the first type was described not long ago in our own columns.[1] Once the condition has been recognised operative treatment is usually a simple matter, according to Young and McKay, who have had satisfactory results from the use of a small-sized punch of the type associated with Young's name. Unfortunately, in the vast majority of cases, the diagnosis has not been made until extensive damage has occurred to the renal tissue, so that the patient, although temporarily relieved of obstruction, ultimately dies of uræmia. In handling these cases the same precautions must be taken as are required in the treatment of long-standing prostatic obstruction. The distended bladder must be slowly emptied through an in-dwelling catheter, and for this purpose a small ureteral catheter will be found useful. Once the urinary tract has been emptied and equilibrium is established cystoscopy and radiography may be carried out in safety. No operation should be undertaken until renal efficiency tests show that a maximum of recovery has been obtained. As for its nature, nothing more than a per-urethral operation is ever required; it may take the form of punching out the valves or of fulguration through a suitable posterior urethroscope. The prognosis naturally depends on the amount of renal damage done before the obstruction was discovered. The points specially emphasised by Young and McKay are the need for early diagnosis, the importance of methods of decompression, and the good results obtainable from a simple punch operation.

[1] A Case of Congenital Valvular Obstruction of the Urethra. By Helena B. King and W. P. H. Sheldon. THE LANCET, 1928, ii., 1126.

ETHER IN THE TROPICS.

THE medical profession in India has been curiously conservative in its allegiance to chloroform. From time to time articles have appeared in the *Indian Medical Gazette* advocating the use of ether, but they have generally attracted little notice, and the result, so far as any extended change from one anæsthetic to the other is concerned, has been almost nil. Quite recently Major J. B. Hance,[1] I.M.S., and Dr. Joti Pershad have made out a good case for the superiority of ether to chloroform, or chloroform mixtures, for anæsthesia in India. They contend that the position of ether is unchallenged in temperate climates and that the same arguments are equally applicable in India, and they ask very pertinently why an anæsthetic which has the advantage of being a cardiac and respiratory stimulant instead of a depressant, and which has none of the dangers associated with delayed poisoning, is not more popular with surgeons practising in that country. Various explanations have been put forward for this attitude, the chief being that chloroform is safer in warm climates than in cold, and that the rapid evaporation of ether, when administered by the ordinary open method, renders its general employment too expensive. As regards the first of these considerations, deaths on the operation table in most Indian hospitals are not subject to any scrutiny comparable to that of the British coroners' courts, which may have something to do with the idea that chloroform is safer in warm climates; it is, however, true that the vapour is not so likely to hang about in undue density as at a lower temperature. With regard to expense, the cost of pure anæsthetic ether may well have been a serious factor in the past, but the position has been simplified by a recent modification of the excise regulations. The method of administration has an important bearing on the question of expense. In a hot country, if the drug is poured direct on to a mask, there is great wastage, but other means of administration are available. Major Hance recommends Shipway's apparatus, which needs no description here. Another apparatus which is not so familiar, but which has certain advantages of its own, is Pinson's "ether bomb"[2]; this has already been used by several surgeons of repute in India. The apparatus consists essentially of a strong steel-container, with a needle valve to control the supply of vapour, which travels through a small-bore rubber tube, and is delivered under an ordinary

[1] Indian Medical Gazette, September, 1928.
[2] See THE LANCET, 1921, i., 336.

open mask, by means of a metal nozzle inserted through the covering of the mask. When in use the container is placed in a large bowl of boiling water, which is renewed from time to time according to the instructions. The apparatus seems particularly suitable for up-country use. It may be recalled that chloroform long held its own in Edinburgh. Even now the simplicity of administration remains a great advantage, and one may still occasionally hear a devout aspiration, from an overworked general practitioner, for a Scotsman with a bottle of chloroform and a piece of lint. But, except in India, considerations of this kind are not allowed to outweigh the superior safety of ether. The latter has been used regularly in the Philippine Islands under tropical conditions, and surgeons in many lands have demonstrated the fact that a warm climate does not contraindicate its use. Any inconvenience which may arise from the employment of special apparatus, or the slight delay in the induction of anæsthesia, is more than compensated by the feeling of confidence.

THE CONTROL OF MEASLES.

THE old proverb about taking the horse to the water seems to be borne out by the state of affairs which, according to the local press, exists in St. Helens. We learn that the medical officer of health of that county borough at a recent meeting of the public health committee was moved to express his disappointment with the response made to various administrative measures intended to meet the needs of the population during the measles epidemic which presently prevails. These arrangements are what have now come to be regarded as standard practice by public health workers and consist of arrangements for the visitation of patients in their homes by trained nurses, and the setting aside of hospital accommodation for cases requiring it. How far these praiseworthy efforts have justified their provision may be calculated from the fact that in 1927 among 2892 cases of measles, assistance in home nursing was sought in only 59, and of 78 cases admitted to hospital 60 proved fatal. In 1928, of 1336 cases, home nursing was sought on behalf of 14 and hospitalisation for 21. In January and February of this year, although 572 cases have occurred, 10 only have had home nursing, and in two four-weekly periods of the present epidemic 35 deaths have occurred. From this evidence Dr. Frank Hauxwell's complaint seems to be well founded. The reluctance to take advantage of the services provided is ascribed to great apathy of the citizens and lack of support on the part of the general practitioner. Possibly, however, the good offices of the latter, like those of the medical officer himself, are themselves reduced to naught by the inertia of the parents. The negative attitude of the public about measles is nothing new and may be due to the fact that during epidemics, while few escape who are unprotected, the great mass of those attacked, and especially older children, come off comparatively lightly, so that the majority of parents are not impressed with the danger. In the past the serious results of scarlet fever and diphtheria were well established in the popular memory and the dread of these diseases is still a factor to be reckoned with. Now that their mortality has fallen, measles is left prominent among the causes of death in childhood, but this fact has not apparently got home to the community at large. The only way in which the public can be brought to realise the dangerous nature of measles is by propaganda, and of all the forms that can be directed on this particular problem there is little doubt that the tactful influence of the nurse in home visiting is the most effective. We think that Dr. Hauxwell is right in giving this measure a prominent place in his anti-measles campaign, but like other forms of propaganda, it must find its own way to the persons whom it is necessary to stimulate. We do not know what has been the custom of St. Helens, but many authorities have found it advantageous not to wait for applications from parents, but to seek out cases which have come to their knowledge through absence from school, infant welfare centres, and other places. Visits to affected homes often supply information about cases in other houses, and experience has shown that the district nurse, to whose ministrations the people are accustomed in other types of illness, is well suited for this class of work. Furthermore, these nurses are already in daily contact with practitioners in respect of ordinary routine cases, their visits are seldom regarded as intrusions, and often they will urge the calling in of a medical man at a stage in the illness when he can usefully intervene. It should be realised that during measles epidemics the resources of a health department may be greatly taxed and energies may have to be diverted temporarily from other less urgent activities and concentrated on the problems of the moment. There is another way of attacking an epidemic of measles which has been proved effective but is not sufficiently exploited in this country—the prophylactic injection of serum from convalescents. Clinics and laboratories for the collection, preparation, and distribution of measles serum have been established for several years now in Paris, Berlin, Munich, New York, Vienna, and many other towns, and the reports from each centre are favourable. In Paris alone during the last four years nearly 4000 children have been injected with convalescent serum with marked success, and the organisation is rapidly progressing. In London the Metropolitan Asylums Board prepares just enough serum for its own use. The collaboration of Dr. Richard Massingham, medical officer in charge of the London Fever Hospital, has enabled the Hospital for Sick Children, Great Ormond-street, to obtain serum for use in threatened epidemics. In an emergency the Middlesex Hospital has been supplied from this source, and also a few private practitioners. But in the provinces, as far as we know, there has been no attempt to bottle convalescent serum for use outside the institution in which the patients are being treated. It is to be hoped that the article by Dr. Nabarro and Dr. Signy, published on p. 1106, will arouse interest in this method of prophylaxis, and that practitioners will demand at least such facilities as are available in other countries for the supply of serum. Although there is no striking national epidemic, many deaths are occurring weekly from measles. Experience has proved that many of these deaths could be avoided if good use were made of the proved willingness on the part of adult convalescents in fever hospitals throughout the country to act as donors. It may be that in the future a more convenient source of serum will be found, but at present, according to Gunn, the animal serums supplied have not proved effective, and human serum remains the only certain method of controlling the disease.

THE INITIAL LESION OF SLEEPING SICKNESS.

ON Sept. 16th a European on a plantation in Cameroon noted a smarting pimple on his face; next day he had fever and slight shivering, and that night he was greatly worse. On the 18th Dr. Graf, at Buea, was told that the patient had a boil, and as it sounded not unlike malignant pustule, he went to see for himself. He found [1] a round inflamed area, about an inch across, on the left side of the face just below the ear; there was a red spot in the centre, around that a pale ring, looking like blisters run together, and outside this another red ring. The neighbouring tissue was swollen, and the central "boil" was hard and painful; the temperature was 102° F., and the pulse-rate 100. A bystander said the boil reminded him of a tsetse sting another friend on the same plantation had had two years before. A drop of blood was taken from the inner edge of the white ring, and in the stained film many

[1] Arch. f. Schiffs- u. Tropen-Hygiene, April, 1929, p. 219.

trypanosomes were seen. Next day the patient was taken to Victoria to have the diagnosis confirmed. On Sept. 20th, which was the fourth day of the illness, trypanosomes were found in the finger blood. Germanin 1·0 g. was given intravenously on the 20th, 22nd, and 24th. Parasites were not seen on the 23rd or later, and after that day there was only a trace of albumin in the urine and the boil healed. In his report Dr. Graf said that he was keeping the patient under observation and would repeat the course of germanin in two or three weeks, and test the blood by inoculation if no trypanosomes were seen. He thought that a cure might already have been effected.

One case leads to another. A second patient from the same plantation, having heard of the earlier case, came to Dr. Graf on Sept. 23rd. He believed that he had been bitten on the right temple by a tsetse-fly eight days before; he had at least seen the fly make its escape. The development of the lesion had been similar but less acute; it had decreased after the third day, and had disappeared by the fifth. Always well before, the patient had since suffered from headaches and had lost his appetite. Trypanosomes were found on immediate examination of blood from the finger, and he had his first injection about Sept. 29th. The temperature went up and no trypanosomes could be discovered, though there were parasites of subtertian malaria. The patient took germanin and quinine at the same time without inconvenience.

THE ACTION OF THALLIUM

Buschke has done more than any one else to establish the therapeutic value of thallium, and his views deserve careful study. A recent paper,[1] in which he collaborates, classifies the effects of the drug into specific and non-specific. Those noted in the chronic poisoning of animals—especially young rats which appear to be more susceptible than rabbits or guinea-pigs—are as follows: (1) alopecia, specifically limited to the hairs enervated by the sympathetic; (2) disturbances of bony growth, resembling those of rickets and osteomalacia, together with a tendency to cataract and iritis; (3) cessation of the normal sexual periods, which can be restored by administration of ovarian and pituitary extracts; and (4) eosinophilia, hypochlorhydria, alkalosis, and convulsions. (5) Gastric tumours somewhat resembling those produced by Fibiger but not of the same malignancy, may also be observed, and lastly (6) there is an antihidrotic action, on which the whole fabric of thallium therapy was originally based, almost certainly depending on an endocrine-sympathetic action. As applied to man, however, the chronic effects of thallium acetate do not concern us. The drug is administered for the epilation treatment of tinea tonsurans in a single dose of an average strength of 8 mg. per kg. body-weight, and, according to most observers, must on no account be repeated within a period of at least three months. Young children tolerate it much better than those who have passed the age of puberty, a fact which is held to support the theory that it acts partly on or through the endocrines. The specific effects of thallium are shared in lesser degree by other metals in the same "heavy" series. Thus lead may produce slight epilation and an inhibition of breeding proclivities, whilst gold and arsenic, and incidentally salvarsan, are sympathetico-tropic in their toxic effects. The pains in the knee so often observed in children treated with thallium may be traceable either to some intramedullary influence on the bones, or to a mild peripheral neuritis. The non-specific effects of thallium are the same as those encountered in the toxicology of all the heavy metals. They include damage to the axis-cylinders of nerves and to the central nervous system itself, optic atrophy, various cutaneous eruptions, and above all, damage to the renal epithelium. For this last, especially, a careful watch should always be kept, although a slight degree of albuminuria is common and need cause no alarm.

[1] Buschke, A., Loewenstein, L., and Joel, W.: Med. Klin., March 22 d, p. 462.

LORD ROSEBERY.

THE death of the Earl of Rosebery on Tuesday last, shortly after his eighty-second birthday, recalls the sympathetic comprehension with which he regarded the medical profession at a time when its public reputation was in some measure in jeopardy. On the eve of the coming into force of the National Insurance Act of 1912 Lord Rosebery, as Chancellor of the University of London, addressed the students of the London Hospital on what he described as the noblest secular profession in the world. He set out in eloquent words the many directions in which medicine was necessarily a forlorn hope; first, in that it never despaired and was always seeking new inspiration and new strength for the battle which could only have one termination, and again because disease when surmounted and conquered was sure to spring up in some new form. He went on to speak of a life spent in the complete conquest of obstacles as a rare one in any profession, and his words can hardly have failed to inspire courage and determination in the hearts of a number of his hearers who were just entering upon the profession of medicine at one of its most critical periods.

THE Interstate Post-graduate Assembly of North America will meet in London next week, when a series of lectures will be delivered at the House of the Royal Society of Medicine. The first session will be opened at 10.15 A.M. on May 27th by Sir John Bland-Sutton, after which short discourses will be delivered by Dr. James Collier, Mr. Victor Bonney, and Dr. Henry Semon. On the next day Sir John Broadbent will preside; Mr. J. E. H. Roberts and Sir William Willcox will give addresses; and Dr. R. G. Canti will give a cinematograph demonstration of tissue cells growing in vitro. On May 29th Sir W. Arbuthnot Lane, Dr. Donald Hunter, and Mr. Donald Armour will speak. In the afternoon special programmes have been arranged at ten general and special hospitals. At 8.30 P.M. on May 28th and 29th receptions will be held respectively at the Wellcome Historical Medical Museum and at the Royal Society of Medicine.

THE St. Cyres Lecture of the National Hospital for Diseases of the Heart will this year be given at the hospital at 5 P.M. on Thursday, June 6th, by Dr. R. O. Moon. His title will be Some Observations on Diseases of the Myocardium.

TWO large anonymous gifts to hospitals, intended as thankofferings for the King's recovery, have been announced within the past few days. Money to the amount of £10,000, together with freehold properties worth about £48,000, have been given to endow the proposed new hospital at Southend-on-Sea, whilst the Royal Portsmouth Hospital has been offered a pound for every pound raised by the end of the year, up to £40,000. The income from the properties made over to the Southend Hospital will not become available for ten years unless the donor should die within this period.

ALEXANDRA DAY.—Wednesday, June 12th, has been fixed as the date of Alexandra Day. Since 1912, when it was begun, about £1,500,000 has been collected.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

CCXCIII.—THE PROPHYLACTIC TREATMENT OF MEASLES.

IT is opportune, in the face of the recent rather severe epidemic of measles in some Midland cities, to bring up anew the subject of prophylaxis of this disease. In this outbreak there have been many hundreds of cases reported with a considerable number of deaths. In our opinion these numbers could have been very greatly reduced had the use of convalescent measles serum been more generally adopted and contacts more vigorously treated. Moreover, the family doctor is often faced with the demand for advice as to how to protect a younger or more delicate child from infection when measles has been diagnosed in one member of the family who is being nursed at home. Isolation is sometimes impracticable under modern housing conditions and, in any case, the infection may have been passed on before the sick child was separated from its brothers. There might at present be some difficulty in obtaining convalescent serum for a case seen in private, since young children cannot safely be used as donors, but if the demand became insistent doubtless adult volunteers could be secured by arrangement with the medical officer in charge of local fever hospitals. Even where this is not possible, the alternative method, described below, of giving whole blood could be used, and for this purpose sufficient blood could be taken from all but very young children.

Our experience has been chiefly with institutional cases, and it is from this point of view that the following notes have been compiled. When for any reason there is particular anxiety to avoid the infection of a particular child, the practitioner should find it possible to procure the material necessary to ensure prophylaxis or at least a very mild attack.

Convalescent measles serum was used in prophylaxis and treatment of measles many years ago on the Continent, but fell into general disfavour owing to faulty technique in its preparation. Cases are reported of death following grossly contaminated sera and also of a tuberculous lesion of the skin at the site of inoculation. In recent years many attempts have been made by various workers to isolate a streptococcus from cases of measles and to produce on a large scale an antitoxic serum. R. Tunnicliff, N. S. Ferry and L. W. Fisher, and R. Degkwitz, amongst others, have all produced sera which have had extensive clinical trials and have, so far, all been found to be inferior to convalescent measles serum in their power to prevent or modify an attack of measles. Gunn, working at the Metropolitan Asylums Board (THE LANCET, 1928, ii., 691), compared the three sera mentioned with convalescent serum and found that whereas Tunnicliff's serum protected 43 per cent. of contacts, Ferry and Fisher's serum protected none, Degkwitz's protected 40 per cent., and convalescent measles serum protected 95·7 per cent. These figures show a marked superiority in the protective powers of the convalescent serum, and this is supported by the fact that the non-protected cases were markedly attentuated.

Preparation of Serum.

This presents one or two difficulties, the most important being that the majority of cases of measles occur in children, and it is difficult, and often inadvisable, to take much blood during their convalescence. We have been particularly fortunate in the collaboration of Dr. R. Massingham, superintendent of the London Fever Hospital, who has collected a large amount of blood for our combined uses from the numbers of adult measles cases which are admitted to his hospital. Many adult volunteers gave 200–300 c.cm. of blood, and suffered no ill-effects. Care is taken to ascertain that there is no tuberculous or syphilitic taint in the family history, that the case was not a complicated one, and that the patient is not incubating another disease. The blood is taken on the seventh–tenth day after defervescence, collected aseptically into sterile tubes, and allowed to clot. The serum is pipetted off when separated, and the remaining clot loosened and centrifuged. By this means we have been able to obtain as serum at least 50 per cent. of the blood collected. Each batch is tested for sterility, the Wassermann test is done, and 0·5 per cent. phenol is added. If these tests are satisfactory, the batch is pooled with several others to make a serum of fairly uniform potency. Before final bottling, the serum is filtered and another sterility test is done. Some workers advocate heating the serum on two successive days at 56° C. for one hour. Prof. R. Kraus, of Vienna, inoculates a sample of each batch of serum into a guinea-pig to make certain of the absence of tuberculous infection. In no case hitherto has tuberculosis developed in the guinea-pigs, and this should be sufficient proof of safety.

Indications for Use.

1. *The protection of young children* in whom an attack of measles might have a fatal or very severe effect. This applies particularly to sick children, such as those who have recently been operated upon and then been exposed to infection, or those suffering from other acute diseases.

2. *The prevention of the spread of infection.* All contacts in hospitals and institutions should be inoculated within six days of exposure. This protects the contact in about 90 per cent. of all cases and efficiently prevents the spread of the disease. It also saves a great deal of expense and worry to those responsible for the institutions, and is particularly useful in fever hospitals to prevent cross infection from spreading.

3. *The attenuation of an attack.* This is achieved by injecting the serum from the sixth to the ninth day after exposure. In most cases so treated the incubation period is prolonged and the attack is greatly modified, there being a greater interval between the initial coryza and the appearance of the rash (six days in one case) and the absence of Koplik's spots. This method has a great advantage when used apart from institutions, because it confers a permanent active immunity against the disease, whereas inoculation in the early incubation period gives a passive immunity lasting approximately three weeks.

4. *In the diagnosis of measles.* If the serum is injected on the tenth day, the course of the disease will be unaffected, but the so-called Debré phenomenon will be observed—an area of blanching of the measles rash around the site of an intradermic injection of the convalescent serum. The potency of the serum can be gauged by the Debré phenomenon. Intradermic injection of serum into a well-developed measles rash has not produced blanching in any of the cases in which we have tried it—cf., the Schultz-Charlton reaction in scarlet fever.

Convalescent serum has been used therapeutically in the treatment of severe cases of measles, but although large doses of the serum have been injected, no improvement that could be attributed to the serum has been noted.

Dosage.

Sutherland and Anderson, when attacking an outbreak at the Monsall Hospital, Manchester, used 10 c.cm. given subcutaneously, irrespective of age, condition, or length of exposure. This is a very large dose, but it is advocated when it is essential to wipe out a local epidemic. Debré, at the Paris Clinic, uses 3 c.cm. for children under 1 year, and this is increased by 0·5 c.cm. for every additional six months.

We have used 3 c.cm. for children up to 3 years of age and 5 c.cm. for children over 3. These amounts, however, were not strictly adhered to, an extra c.cm. being added if the children were well-developed for their ages. All our injections were made intramuscularly, and in no case was any untoward effect of the serum noted, there being no serum sickness or rash.

Gunn's dosage was much like our own, but he prefers to give the injections intramuscularly on the second or third day of incubation. He finds a greater percentage protected than with first day injections.

Injections of Whole Blood.

W. S. C. Copeman, who has recently written a good résumé of this subject (Proceedings of the Royal Society of Medicine, May, 1927), states that in cases of emergency citrated whole blood may be used in place of serum. Such a procedure might be of value where one child in a family was convalescing from measles, and it was thought desirable by the practitioner to protect one or more of the patient's brothers and sisters. As the blood would be injected subcutaneously or intramuscularly, there would be no need to do a blood-grouping, but the dose of blood injected would have to be about double the amount of serum which would have been given. One c.cm. of 10 per cent. solution of sodium citrate taken up into a 10 c.cm. syringe would prevent the coagulation of that amount (10 c.cm.) of blood.

Results.

Debré reports 80 per cent. complete protection over a very large number of treated children. Gunn reports 95·7 per cent. of complete protection. Of the five cases which developed measles three had been injected on the first day and two on the eighth day. Those injected on the first day could hardly be diagnosed as measles. The control cases of Gunn and of Sutherland and Anderson show a very high percentage of infection.

In our own series 55 children housed in wards which had had cases of measles were injected usually on the second day of exposure. Some of these cases, however, were children who were newly admitted into a measles-infected ward without any further precaution. This procedure was justified inasmuch as none of the children developed measles. The ages of the children varied from six months to twelve years. Fifty-one cases were completely protected—i.e., 92·7 per cent. Of the remaining four, one developed an apparently normal attack 16 days after the injection, two others had very mild attacks (19 and 21 days), and one had a doubtful attack (21 days). In view of the epidemic, however, it was thought advisable to send these mild cases to the fever hospital. Certain wards, where the use of serum was not allowed, served as controls, although not scientifically exact ones. The incidence of infection in these wards became high and eventually they had to be closed completely, or open only to children who had definitely had measles previously, and whose parents were willing to risk the infection.

Conclusion.

We agree with Gunn that until an animal serum more efficacious than those at present available is put upon the market, human convalescent serum is the only certain method of controlling measles. Even if it were possible by this means to stamp out the disease, it is doubtful if, on epidemiological grounds, such a policy would be a wise one. It should be our aim, however, to protect *every* child under 3 years of age, as well as older children who are in feeble health, from contracting measles. The method is already being applied to a limited extent in institutions in this country, but it should be used in suitable cases in private practice, either for prevention—i.e., production of passive immunity—or preferably and where possible for attenuation—i.e., production of active immunity. As has been pointed out, no ill-effects are noted where the serum has been carefully prepared, and as the serum is of human origin there is no fear of anaphylaxis following upon its injection.

D. N. NABARRO, M.D., F.R.C.P. Lond.,
Director of the Pathological Department, The Hospital for Sick Children, Great Ormond-street.

A. SIGNY, M.R.C.S. Eng.,
Assistant Pathologist to the Hospital.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg.-Comdr. P. F. Woodruff-Minett is placed on the Retd. List with rank of Surg. Capt.

C. J. Farr to be Surg.Lt.

The following appointments are notified: Surg. Lts. J. W. Simpson to *Excellent*; R. C. Webster to *Dolphin*, temp.; and H. J. McCann to *Mackay* (on recommg).

ROYAL NAVAL VOLUNTEER RESERVE.

Proby. Surg. Lt. J. D. Simpson to be Surg. Lt.

Proby. Surg. Sub-Lieut. D. MacK. Craig to be Surg. Sub-Lieut.

ROYAL ARMY MEDICAL CORPS.

Lt.-Col. W. J. S. Harvey, having attained the age for compulsory retirement, is placed on retd. pay.

Lt.-Col. F. J. Garland retires on retd. pay.

Maj. G. S. McConkey relinquishes the appt. of Dep. Surg., R. Hosp., Chelsea.

Maj. F. M. Lipscomb to be Dep. Surg., R. Hosp., Chelsea.

The undermentioned Majs. to be Lt.-Cols.: C. E. W. S. Fawcett and A. M. Rose.

Lt. (on prob.) W. F. L. Hannay, from the secd. list, is restd. to the estabt.

TERRITORIAL FORCE.

Capt. H. C. Sands to be Maj.

Capt. A. C. Ballance resigns his commn.

Lt. A. Roberts (late R.A.M.C., Supp. Res. of Off.) to be Lt.

TERRITORIAL ARMY RESERVE OF OFFICERS.

Lt. F. R. Daniel, from Active List, to be Lt.

ROYAL AIR FORCE.

Flying Officer R. E. Alderson ceases to be seconded to the Royal Victoria Infirmary, Newcastle-upon-Tyne.

Surg. Lt.-Comdr. T. N. D'Arcy, having obtained the highest aggregate marks at the examination held in 1929 for promotion to the rank of Surgeon Commander, has been awarded the Sir Gilbert Blane gold medal.

ENLARGEMENT OF CHELMSFORD HOSPITAL.—It is intended to enlarge the Chelmsford and Essex Hospital by the addition of men's and children's wards, out-patient, and casualty and other accommodation.

LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE.—Lieut.-Colonel G. S. Parkinson, D.S.O., R.A.M.C. (ret.), has been appointed part-time assistant director of hygiene at this school.

During the late war Colonel Parkinson was Deputy Assistant Director of Hygiene with the First Army, and later Assistant Director of Medical Services. After the armistice he served for five years D.A.D.H. at Gibraltar, where he undertook the duties of Medical Officer of Health for the civilian population and the administration of a complete health department responsible for sanitation, school medical work, tuberculosis, venereal diseases, maternity and child welfare, and poor-law medical service. On his return from Gibraltar, he was appointed Assistant Professor of Hygiene at the Royal Army Medical College, Millbank, and held the senior post for several months during the absence of the Professor on leave. After his retirement in July, 1927, Colonel Parkinson held several temporary posts in the public health service before becoming assistant to the Executive Secretary of the Society of Medical Officers of Health. For the past six years he has been hon. secretary of the Naval Military and Air Force Hygiene Group of this Society.

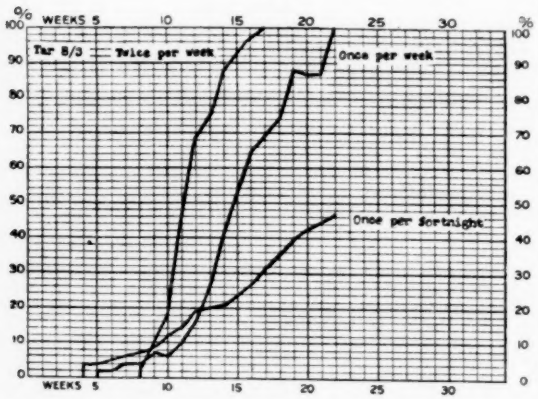
Special Articles.

SOME FACTORS INFLUENCING THE DEVELOPMENT OF EXPERIMENTAL OIL AND TAR TUMOURS IN MICE.

BY C. C. TWORT, M.D. ABERD.,
AND
J. M. TWORT, B.SC. LOND.,
PATHOLOGIST AND ZOOLOGIST TO THE MANCHESTER COMMITTEE ON CANCER.

ALMOST all our early experiments with carcinogenic agents consisted in the application of the tar or oil to the backs of 100 mice twice weekly. This procedure constituted our standard experiment. For several reasons we imagined that when using a strong agent, such as a synthetic tar, the intervals between the paintings was not long enough to enable the epithelium to give a maximum response, while with a weak agent, such as an American petroleum oil, the interval between the paintings was probably too long. In the former case it is possible that the epithelium is so damaged that it is unable to perform the healthy functions of an active tissue, while in the latter case a certain degree of tolerance or immunity to the agent applied may supervene, with the result that tumour development is delayed. There seem to be four chief aspects of the problem of tolerance and immunity. A tolerance may be developed simply from a thickening of the epithelium, or there may be an acquired local or general immunity of the cells of the host to the agent applied. The tolerance or immunity may be developed to the specific carcinogenic substances or to the tissue-destructive substances so frequently associated with oils and tars. It does not appear that in either oils or tars the carcinogenic substances and tissue-destructive substances are necessarily identical.

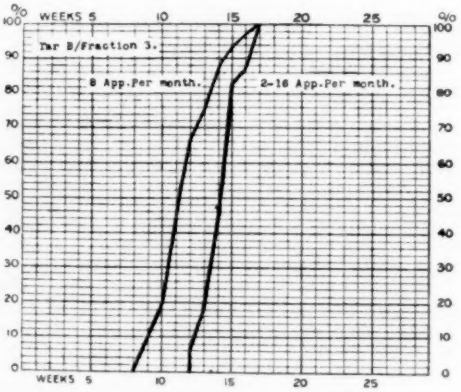
FIG. 1.



Stages in Development of the Method Employed.

These considerations led us to deviate in both directions from the frequency of application in our standard experiment. Our synthetic tars were applied to the skins of animals only once a week or once a fortnight, while mineral oils were applied daily, five times a week. Two experiments with a pinene synthetic tar have been discussed previously,[1] so that here it will be sufficient to give a graph of the final results (Graph I.).* The feature of interest in these experiments is the early development of the first tumour in the skins which were allowed long intervals of rest from contact with the carcinogenic agent, and the subsequent falling-off in the number of tumours developing as the skins acquired a tolerance for the agent. The control animals of the standard experiment were unable to react to the too powerful agent until a tolerance had developed, when the tar was what may be considered 100 per cent. active, or—what comes to the same thing—when the skins were 100 per cent. responsive to this particular agent.

FIG. 2.



From these results it seemed obvious that to obtain the steepest graph with a very powerful agent it would be necessary to commence the experiment with applications at long intervals and gradually to increase the frequency of the applications to keep pace with the skin tolerance developed.

We conducted an experiment wherein the 44 applications of an experiment lasting 22 weeks were not equally distributed over the whole course of the experiment. Two applications were given during the first month, 4 during the second month, 12 during the next six weeks, 18 during the following six weeks, and 8 during the last two weeks. In Graph II. will be found the results of painting the animals 2–16 times per month compared with those of the standard experiment, wherein the animals were painted 8 times per month.

The experiment was very unsatisfactory owing to a poor batch of animals. For this reason there were no early tumours—i.e., the occasional very susceptible animal usually found among each batch was absent. The general development of tumours was later than that among the controls until the seventeenth week, when in both experiments all animals remaining alive were bearing tumours. At this stage of the experiment the controls had received 34 applications, while the batch painted 2–16 times per month had only received 27 applications. In this respect the experimental results were in conformity with our anticipations, but we are not satisfied that they are reliable, and the experiment is being repeated.

Our first oil experiment consisted in the daily application of shale oil to the backs of 100 mice five times per week. The refined sample of shale oil used had a moderate degree of carcinogenic activity, being somewhat less powerful than the average gas tar but very much more active than any American petroleum oil we have tested. The results of this experiment were in accordance with our expectations. The first tumour appeared during the ninth week after the commencement of the experiment, and at the twenty-third week the few animals remaining alive all bore tumours. The first tumour appeared among the animals of the control standard experiment also in the ninth week, but at the twenty-third week only 41 per cent. of the animals living bore tumours. Malignancy supervened six weeks earlier

[1] Jour. Hyg., 1928, xxviii., 219.

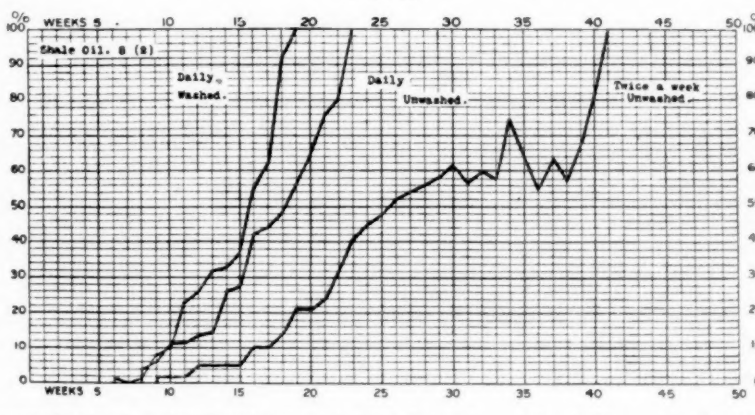
* The graphs are compiled from the percentage of living animals which bore or had borne tumours at the end of each week since the commencement of the experiment. As 100 animals were used for each experiment and the duration of the experiments was not long, in order to make the graphs clearer the death-rates have not been included.

in the animals painted five times per week than in the controls, and Graph III. shows that the general development of tumours among the more frequently painted animals reached a high level much more quickly than among the controls.

The effect of the frequent application of the American petroleum oils was then tested, and it was found that tumours developed earlier than when the oils were applied only twice a week.

Oil No. 3, a highly refined Pennsylvanian oil, applied twice a week to two groups of 100 animals, gave rise to the first tumour in the thirty-fifth and the thirty-eighth week respectively, while among the animals painted five times a week the first tumour appeared as early as the eighth week, and it had become malignant by the twelfth week. Malignancy did not occur among the control animals until the fifty-ninth week. Similarly, oil No. 9, a refined Californian oil, which in two standard experiments induced a tumour in the nineteenth and the fourteenth week, when applied five times a week induced a tumour in the remarkably short time of two weeks. By the tenth week 10 per cent. of the animals remaining alive bore tumours, while among the control animals painted twice a week no tumours had arisen at this stage.

FIG. 3.



Three further samples of refined lubricating oils are being applied to animals frequently, but it is too early to draw definite conclusions from the experiments, although the hyperplastic response of the epithelium can already be seen to be excessive as compared with that found in the standard experiments. Meanwhile we have been unsuccessful in inducing tumour formation by the daily application of two oils, No. 4, a liquid paraffin, and No. 12, a sperm oil, which had given us negative results in our standard experiments over 85 and 70 weeks respectively.

When we began our investigations on the carcinogenicity of lubricating oils we endeavoured to obtain a reliable method of concentrating the active principle to enable us to make a more rapid diagnosis of a particular sample than was possible when using the whole oil. It appears from our results with the daily applications that we have here a reliable and even quicker method than that of the bi-weekly application of the concentrated oils. Whether daily application of the latter will still further shorten the period necessary for diagnosis is doubtful, although we are proceeding to test this possibility.

The Protection Offered by Animal Fats.

It has been shown that, if the superfluous tar which may remain on the back of the animal from a previous painting is removed by petroleum ether before the next application, tumours develop more rapidly than in control animals where the tar is not removed. It was imagined that these results were due to the removal of the hard cake of tar, thereby permitting an easier penetration of the active substances which were contained in the fresh tar. A more likely explanation seems that the petroleum ether removed the natural skin fats so that the tar could penetrate more easily than when applied to untreated skin.

We have found that tumour development is very much delayed if, during the intervals of painting of animals with a potent carcinogenic agent, an emollient oil, such as anhydrous lanolin, is smeared over the skin to soften it and to protect it from the air.

In our first lanolin experiment 100 mice were painted twice a week with a very potent synthetic tar, and on two days between each application lanolin was smeared over the painted area. It was at once noticed that the hair was much less inclined to fall than among the control animals painted only with tar, but nevertheless the few first tumours appeared very early, possibly for the same reason as that given when discussing the early tumours in animals painted with tar at infrequent intervals. Subsequently tumour development among the lanolin-treated animals fell behind that of the control animals, while the tendency for malignancy to supervene was remarkably low.

Graph IV. gives a good idea of the protective action of lanolin; during the middle of the experiment, when conditions may be considered relatively stable, the lanolin delayed the advent of tumours by about 3–4 weeks.

A further confirmatory experiment consisted in the utilisation of shale oil instead of the synthetic tar, when the protection offered by the lanolin was even more clearly shown. The experiment has been in progress for 30 weeks without the advent of a single tumour, while among the control animals untreated with the lanolin at this stage of the experiment 61 per cent. of the animals remaining alive were bearing tumours and 21 per cent. malignant tumours. Not even one or two very early tumours developed in the treated animals, which fact accords with our experience that the shale oil is only a moderately powerful agent. As by this procedure we were unable to demonstrate any carcinogenic activity of the shale oil we performed a more severe test on the protective action of the lanolin. Animals are being painted daily with the shale oil and later in the day a small amount of lanolin is being smeared over the painted area. Also we are investigating the effect of adding a small percentage of lanolin to the shale oil and subsequently applying the mixture daily. It has to be remembered that animal fats are sometimes utilised for the blending of mineral lubricating oils, which may be an important factor in the number of tumours arising in certain groups of spinners. Also, if it is true that wool-spinners do not suffer from epithelioma to the same extent as cotton-spinners, the explanation may lie in the fact that a small quantity of animal fat is intermixed with the oil in the wool-spinning rooms, while no animal or vegetable oil contaminates the mineral oils in the cotton-spinning rooms. Incidentally, our results with the lanolin and our results from washing experiments, about to be described, lend support to the thesis that ichthyotic and xerodermatous skins are more liable to be the seat of epitheliomata than are normal skins.[2]

Removal of the Natural Fats.

The protection offered to carcinogenic agents by the application of a small quantity of an animal fat led us to conduct experiments in the opposite direction—i.e., to remove the natural fat of the skin when in contact with and before the application of the carcinogenic agent.

The first experiment consisted in daily application of

[2] Savatard, L.: Proc. Roy. Soc. Med., May 19th, 1927, p. 1589.

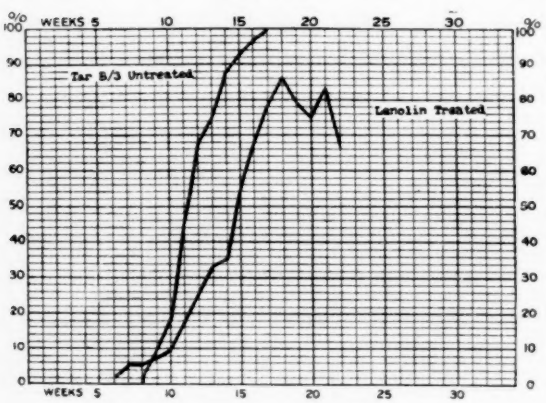
shale oil to mice five times a week, and the subsequent daily removal of the oil with ordinary soap and water. Each day 200 animals were painted with the oil in the early morning, and about six hours later the oil was removed from the painted area of 100 animals by soap and water, the skins being rinsed with pure water and dried with cotton-wool to remove excess of soap. The manipulations being made with care, the animals tolerated the treatment extremely well, and it was found that the death-rate compared favourably with that of the controls.

Graph III. shows that tumour formation was not delayed by the washing; in reality it was somewhat hastened, despite the fact that the epithelium of the washed animals had only been in contact with a superfluity of the oil one quarter the time of the control epithelia.

Our results were different when dealing with less active agents such as American petroleum oils. Two similar washing experiments were performed with oils Nos. 3 and 9, the Pennsylvanian and the Californian oils. With oil No. 3 the first tumour among the washed animals appeared one week after the first tumour among the unwashed animals, the tumours appearing in the ninth and eighth weeks respectively. With the Californian oil the first tumour in both groups of animals was observed as early as the second week. However, as the experiments proceed, it is found that tumours are not arising so frequently among the washed animals as among the controls, so that it appears that partial removal of the oil with soap and water does offer some protection to the noxious action of these weak oils.

In view of these results we thought it advisable to lessen still further the duration of contact of shale oil with the skin, when we imagined that we should arrive at a contact time in which tumour formation among the animals would fall behind that of the controls. Accordingly 100 animals were painted five times a week with shale oil No. 8, and each day the animals were washed with soap and water one hour after the oil had been applied. In this group of animals the first tumour appeared in the fourth

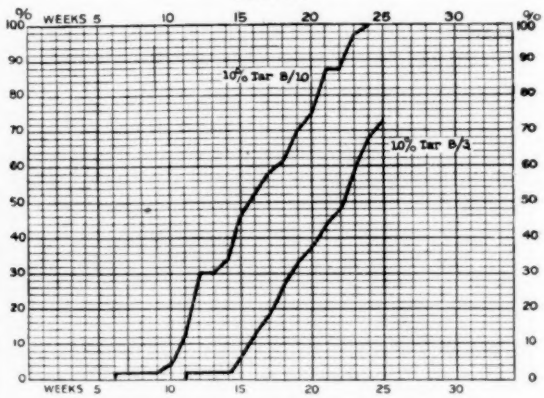
FIG. 4.



week, an exceedingly early date for the development of a shale oil tumour. We have so far had no more tumours, but the death-rate among the animals has been very high and the experiment will presumably have to be repeated. As a result of this experiment a further 100 animals are being painted with shale oil which, as far as possible, is being removed immediately with soap and water, in order to get an idea of the minimum time it is necessary for the oil to be in contact with the skin for a tumour to supervene.

We have used soap and water to remove the superfluous oil because of its use in ordinary life. We have, of course, appreciated the fact that only the surface mineral oil and some of the natural skin fats are removed by this mechanical means. Presumably minute quantities of the mineral oil would not be removed but would be rubbed into the pores of the animal's skin, and this residual oil might be sufficient to give rise to new growth formation. On the other hand, a carcinogenic agent may exert practically all its toxic action immediately on being applied. In consideration of these possibilities we have initiated a further experiment wherein the oil is removed by a solvent instead of soap. Shale oil

FIG. 5.



is being applied to 100 mice, and six hours later it is being removed by petroleum ether. In another experiment we are removing the natural fats with the same solvent immediately before the daily application of shale oil. In the former experiment the first tumour was observed in the fifth week, while in the latter the first tumour made its appearance in the third week.

The Effect of Dilution of the Carcinogenic Agent.

Closely related to the question of the frequency of application of a carcinogenic agent is that of the degree of its activity and consequently of its dilution. In order to obtain a true criterion of the relative potency of any given agent it is necessary to vary one's experimental procedure according to the presumed strength of the agent. Thus when dealing with a strong agent, such as our pinene synthetic tar, we have found that dilution of the fractions extracted was an easy means of getting at the difference of potency of two or more fractions which in the pure state had given almost identical results. When dealing with very weak agents, concentration gives the greatest amount of information.

For example, two Pennsylvanian oils Nos. 1 and 3, when applied as the whole oils, gave results similar to two other Pennsylvanian oils Nos. 7 and 11 which were obtained from a different business source, and there was little to indicate the presence of very active carcinogenic substances among their constituents. Distillation experiments showed, however, that in oils Nos. 1 and 3 there was a small quantity of very active substances; concentration of oil No. 3 by means of methyl sulphite confirmed the distillation results. On the other hand, distillation of oils Nos. 7 and 11 gave no fractions more toxic than the whole oils, and methyl sulphite extraction failed to concentrate to the same extent as in oil No. 3.

We have, as a rule, used ordinary medicinal liquid paraffin as an inert diluent, although this substance may exert a slight protective action on the skin epithelium. Graph V. is compiled from the results obtained by the application of two fractions of a synthetic tar, diluted ten times with liquid paraffin which in the pure state gave results so closely resembling one another that it was impossible to say which was the stronger. When both the fractions were diluted the difference in the carcinogenic activity was at once evident. As the concentration of the active principle in our tar fractions is becoming higher and higher we are diluting still further, and

at present we are utilising dilutions as great as 1 in 100.

We have performed several dilution experiments with shale oil, as this is important from the practical point of view. A 10 per cent. and a 20 per cent. solution of shale oil in liquid paraffin have so far failed to induce the development of a single tumour among 200 mice when applied twice a week, in one case for a year and in the other for a lesser time. However, in practice shale oil is not blended for lubricating purposes with liquid paraffin but with a natural petroleum oil, and it is interesting to note that the activity of a weak American petroleum oil is increased by the addition of a small quantity of shale oil. Thus the addition of 5 or 10 per cent. of shale oil to our Pennsylvanian oil No. 11 gave a blend which, when applied to mice twice a week, induced a tumour as early as the fourteenth and the tenth week respectively, while in the control experiment with the pure oil No. 11 the only tumour observed in an experiment lasting 60 weeks did not make its appearance until the forty-ninth week. Also this tumour remained benign, while the first tumour which developed when using the 10 per cent. shale mixture had become malignant by the twentieth week. It may be mentioned that 200 animals painted with blends of shale oil and oleic acid responded like those treated with blends of shale oil and liquid paraffin. These results indicate that the autolysed scrotal excreta and desquamated epithelium may not play such an important part in the genesis of mule-spinners' cancer as has been imagined by some workers.

In order to get an idea of the actual amount of carcinogenic agent it was necessary to apply to the skin for tumour development to supervene, dilution methods were of little use. The beneficial or harmful action of the diluent itself rendered the interpretation of the results difficult. Also the application of definite minute quantities of the pure oil is impracticable. To overcome these difficulties we used a weak solution of oil in a volatile solvent, so that only a trace of the pure oil would be left on the back of the animal after the evaporation of the diluent. A 1 per cent. solution of shale oil in petroleum ether was applied daily in our first experiment; up to the present time we have obtained several tumours, but the experiment has not been in progress very long.

Conclusions.

1. The early development of tumours is not facilitated and may even be delayed by the too frequent application of a potent carcinogenic agent. With a weaker agent the more frequent the applications the earlier do tumours appear to develop.

2. Similarly, the dilution of a potent agent does not materially affect the time of arrival of the early tumours, while the dilution of a weak agent may render it apparently inert.

3. The carcinogenic activity of a very weak American petroleum oil appeared to be increased considerably by the addition of a small percentage of shale oil. On the other hand, we failed to induce tumours with a blend of a small quantity of shale oil with medicinal liquid paraffin.

4. If the skin of animals which have been painted with shale oil are washed with ordinary soap and water a few hours later the incidence of tumour development is not lessened but may even be increased. The removal of the natural skin fats is presumably harmful. With weaker agents, such as American petroleum oils, the washing seems to offer a certain amount of protection.

5. If lanolin is applied to the skin in the intervals between synthetic tar applications the development of tumours is substantially delayed. In the case of a less potent agent, such as shale oil, the lanolin has, in our experiments, given absolute protection, and no tumours have so far developed in the lanolin-shale oil treated animals.

THE DEATHS OF MERCHANT SEAMEN IN 1927.

By Fleet-Surgeon W. E. Home.

The Board of Trade Return,[1] which includes the deaths on vessels registered in the United Kingdom in 1927, tells us that the "first crews" of ships in that year included 161,800 British, 19,000 foreign, and 55,100 Lascar seamen, among whom 1223 deaths were reported. No suggestion is made of a death-rate for any of these groups, but in 1926 a census was taken of the seamen employed, and the number found on board on the census day was for British seamen 80 per cent. of "first crews," and for Lascars 90 per cent. So, to get a nearer idea of the population at risk, of the ration strength from day to day, it will be better to take these proportions of the first crews as stated—namely, for the British 131,000, for the Lascars 50,000, and with these figures to calculate the death-rates, as the nearest approximation possible.

The total British deaths were 853 (6·48 per 1000), of which 408 (3·10) are attributed to disease, 22 (0·16) to alcohol (a reduction), 40 (0·30) to suicide, and 362 (2·82) to accidents. The total Lascar deaths were 249 (4·98), the corresponding figures being disease 182 (3·64), alcohol 1 (0·02), suicide 13 (0·26), and accidents 47 (1·00). Rather more than half the total deaths were thus due to disease. The chief named causes of death from disease were, for British seamen, tubercle 48 (0·37), pneumonia 42 (0·32), malaria 17 (0·13), enteric fever 16 (0·12), and for Lascars, tubercle 37 (0·74), pneumonia 33 (0·66) beri-beri 14 (0·28), malaria 12 (0·24). It will be noticed that the death-rates from tubercle and pneumonia for Lascars (0·74 and 0·66), who need only have 72 cubic feet of space in their ships, are roughly double those (0·37 and 0·32) of the British seamen, who must have each 120 cubic feet. During the last four years (1924–7) deaths from tubercle of lung and tubercle "other" have been separated in the return, and if they are assembled and the death-rates on "first crews" are calculated, we get the figures, for pneumonia, British 0·3, Lascar 0·6; and for lung tubercle, British 0·17, Lascar 0·6 per 1000, the British having a half-rate for pneumonia, and for phthisis a quarter-rate of that of the Lascars.

By the help of the census figures and those of deaths for 1926, given in the return for 1927, it is possible to make a very approximate estimate of the occurrence of deaths among seamen in sail, steam, and motor-ships, from which it appears that 1634 men were employed in sail, with deaths 4·3 per 1000 from disease, and 11·0 from accidents; 187,536 men, in steam, with deaths 3·8 from disease and 3·1 from accident; and 7338 men in motor ships, with deaths 3·0 from disease and 2·3 from accident. It will be noted, however, that the number in sail was very small, the total deaths being, sail 25, motor-ships 39, steam 1289 in the year 1926.

MEDICINE AND THE LAW.

Prosecution of Unregistered Practitioner.

Lieut.-Colonel J. W. Kynaston, late R.A.M.C., appeared at Marlborough-street police-court on May 15th on two summonses, alleging that he had falsely pretended to be a doctor of medicine and had wilfully and unlawfully used the title of "M.R.C.S. Eng." contrary to the Medical Acts. It was stated for the prosecution that he had been placed upon the Medical Register in 1885, and it was explained that the Medical Act of 1886 created a different and additional qualification for registration. The defendant had

[1] Return of Shipping Casualties, &c., for 1927. H.M. Stationery Office, 1928. Pp. 8 2*s*.

become duly qualified as a Member of the Royal College of Surgeons of England and a Licentiate of the Royal College of Physicians of London. Seven years ago his name was removed from the Register for what was described as, and found to be, "infamous conduct in a professional respect." That did not imply criminal conduct; the explanation was that Colonel Kynaston was convicted of advertising. The Royal College of Surgeons thereupon withdrew its diploma and the Royal College of Physicians expunged his name from the list of licentiates, but recorded that an application for restoration of his licence might be considered after two years. Mr. G. D. Roberts, who prosecuted, said that the defendant was practising at Langham-place and was doing two things which he was not entitled to do; he called himself "doctor" and put this word in front of his name on his brass plate and in advertisements; he was also using the description "M.R.C.S." This, said Mr. Roberts, implied that he was registered under the Medical Act. Counsel seems to have stated the position with fairness. He disclaimed any idea that the defendant was a quack; Colonel Kynaston had the skill to maintain his qualifications. A man not on the Medical Register was entitled to practise in the same way as a medical practitioner, but he must not pretend that he was on the Register or lead the public to believe that he was a registered practitioner. The Register was the hall-mark of professional skill and professional honour. Evidence was given by Mr. G. F. S. Cowell, secretary of the Royal College of Surgeons. In cross-examination, he agreed that he had not asked the defendant to return his diploma after being struck off the Register; the diploma was, it seems, still in Colonel Kynaston's physical possession. Other evidence was given of the draft of an advertisement sent by the defendant for insertion in the *Radio Times*. Colonel Kynaston went into the witness-box and described the circumstances of his removal from the Register: "I did not appeal against the decision of the General Medical Council which I held, and have always held, to be ultra vires, but I admit de facto that my name is not on the General Medical Register; my complaint is, that I have been illegally removed from it." "You never thought it right," remarked the magistrate, "to test it in the High Court." The defendant rejoined that he could not afford the expense; but, if he were to be prosecuted and brought before a criminal court, he proposed at the earliest opportunity to ask the Court of Chancery to say whether or no the General Medical Council had acted within its jurisdiction. "With regard to the title of doctor," he added, "I have been addressed as 'doctor' for 20 years; in the ordinary acceptance of that term I am a doctor; I have never pretended to be a doctor of medicine, it is no false pretence to say I am "M.R.C.S." or "L.R.C.P.," because I have the diplomas in my possession." Mr. Cancellor, the magistrate, adjourned the case sine die, as there was no time to finish it; the parties would have notice of the resumed hearing.

The further proceedings will be awaited with interest. On the general question of the jurisdiction of the Medical Council it is well settled that there can be an appeal to the High Court, but that the High Court leaves the Council to judge in matters affecting the medical profession and refuses to intervene unless some principle of natural justice is violated—e.g., if a defendant has not been informed of the charge against him, or has not had adequate chance to reply thereto, or if the tribunal has acted with bias. The question whether in the circumstances of the present proceedings Colonel Kynaston has been guilty of a false pretence is presumably a question of fact for the magistrate or (on commitment for trial) for a jury. The issue whether it is correct to say, "once a 'M.R.C.S.,' always a 'M.R.C.S.'" is a part of the question of fact. Similar circumstances existed, it may be recalled, when Colonel Kynaston was prosecuted at the Central Criminal Court in November, 1926, on a charge of aiding and abetting the obtaining of a dangerous drug while not a registered medical practitioner. His conviction on that occasion was upset by the Court of Criminal Appeal on the technical ground that the prosecution had in part based the proceedings on the Dangerous Drugs Act of 1925, which at that time had not yet come into operation. It will not be satisfactory to either party unless a definite decision can be reached upon the merits of the case.

The Proceedings against Mr. Raphael Roche.

We are informed that "the officers of the Society of Apothecaries of London, having had the opportunity of investigating the alleged matters of complaint against Mr. Raphael Roche, have satisfied themselves that he had not contravened the provisions of the Apothecaries Act, 1815; and, having obtained from him the subjoined undertaking, the Society are glad to be able to announce that there is now no reason for invoking the powers vested in them under the aforesaid Act." The undertaking signed by Mr. Roche includes the statement that: "I hereby undertake that I will not, in the course of my work, act in such a manner as to contravene the provisions of the Apothecaries Act, 1815, relating to acting and practising as an apothecary."

UNITED STATES OF AMERICA.

(FROM AN OCCASIONAL CORRESPONDENT.)

The Content of a General Practice.

A PRACTITIONER, in a city of 15,000 people in a populous Eastern State, has analysed his diagnosis file containing some 6200 diagnoses entered during the last eight years. He admits that some of the commoner complaints among his patients have doubtless been omitted from the file. In spite of this, and of the natural uncertainty about the rigid classification of certain cases, the results are of considerable interest in showing approximately what are the demands upon a general practitioner in this country. Medical cases number 2499, or 40 per cent. of the total, and surgical cases 1497 (24 per cent.); whilst the following numbers are attributed to the other branches of practice: obstetrics 471, pædiatrics 345, dermatology 322, neurology 274, laryngology 254, gynæcology 156, genito-urinary diseases 140, otolaryngology 100, orthopædics 81, and ophthalmology 73. Among the medical cases colds (281), bronchitis (285), and influenza (290) were the most common, while the inclusion of one case each of Banti's disease, aortitis, tapeworm, and pulmonary embolus shows how long the practitioner may have to wait to use a large part of the knowledge acquired in the schools. The importance of minor surgery in this practice is rather striking; there were 683 cases of trauma and 348 of infection. The pædiatric cases are mostly contagious diseases, to which must be added a number of the diseases of early infancy which would naturally be associated with the obstetric work. Only two cases of rickets are recorded, three of enuresis, and five of malnutrition. In obstetrics placenta prævia was encountered once, eclampsia four times. Of the diseases of eye, ear, nose and throat, the commonest were tonsillitis (333), laryngitis (96), otitis media (64), conjunctivitis (24), foreign body in eye (30), and sinus infection (24). Among the conditions occurring once only are iritis, ectropion, retropharyngeal abscess, and—pyorrhœa! This practitioner's conclusion that more time should be devoted to minor ailments in the medical schools may be justified, but not many will agree with him in wanting the time of education to be allotted in proportion to the frequency of diseases encountered.

Death of Haley Fiske.

The death of the president of the Metropolitan Life Insurance Company removes from our midst a pioneer in preventive and industrial medicine. His belief

that it is a main function of the business of life insurance to promote health has exercised a remarkable influence on the lives of the 25,000,000 citizens of this country and of Canada who are served by the organisation, of which he was president. It was in 1908 that the decision was reached to make a health campaign amongst the policy-holders. Since then more than 535 million health pamphlets have been circulated, and an important nursing service has grown up. It is calculated that, as a direct result of this campaign, more than 350,000 lives have been saved at an economy in death claims to the company of $70,000,000. Less than half this sum has been expended on the health campaign work.

PARIS.

(FROM OUR OWN CORRESPONDENT.)

Aviation in the Service of Medicine.

THE First International Congress of Sanitary Aviation has been a great success, 40 nations or dominions sending delegations. Great Britain was represented by Air Vice-Marshal David Munro and Group-Captain Martin Flack; Australia by Dr. Parks and the Rev. Mr. Flynn; Canada by Captain Williams, head of the Canadian Sanitary Service; and India by Air Vice-Marshal Munro.

Colonel Schickelé (France) and Captain Chochup (Japan), who reported on the use of sanitary aviation in war, consider that the speed of medical aircraft should be 175 kilometres per hour with a range of 500 km. Aeroplanes for the medical services should be gathered together at the beginning of a war out of the available commercial material. It was pointed out that the campaign in Morocco has shown what may be expected of air evacuation, 4500 wounded being brought rapidly to hospital from the front. Colonel Sprich said that before aeroplanes were used there were no "severely injured" in the Morocco hospitals, because they never got there alive.

Among the other topics discussed was the immunity of medical aircraft in warfare and medical aviation at sea. Dr. Garsaux and Dr. Behague discussed the effect of air transport on the patients themselves; for instance, they asked, should men wounded in the brain be carried by air? To this question they thought no positive answer could as yet be given. The use of aircraft in peace-time was the subject of reports by Dr. Tilmant (France) and Dr. Krzys-Koroski (Poland), who urged the need for preparing landing-grounds in great number. A very interesting film was shown to illustrate transportation to hospitals in Sweden, where sick and wounded are carried south from the snowy plains of Lapland to hospitals 300 or 400 kilometres distant. The aeroplanes are equipped with skis or floats for snow or water, according to the place of landing.

At the end of its meeting the Congress passed resolutions to the following effect: (1) That the nations represented should make every possible effort to extend and develop sanitary aviation. (2) That everything should be done in peace-time to make travel easier for medical aircraft, especially by giving them a permanent priority on landing-grounds, and by granting them free crossing of frontiers. (3) That landing-grounds should be as many as possible, especially in countries lacking ordinary means of communication. (4) That encouragement should be given for the conversion of commercial aircraft to medical uses either in peace or war by easy and prompt modification of equipment. (5) That manufacturers should be given moral and material encouragement in their attempts to improve the study and building of medical air material. (6) That international agreement should be reached as soon as possible on the status of medical aeroplanes granting them neutrality in warfare.

The next Congress will study: the equipment, staffing, and security of medical aircraft, and the medical and surgical contra-indications of transportation of wounded by air. A permanent committee will have its offices at the Aero Club of France, 25 rue François 1er, Paris. The president is Prof. Richet (Paris), the vice-presidents being General Bauer (Sweden), General Rouppert (Poland), and Prof. Di Nola (Italy).

Mr. R. Charlet, the secretary, is a dental surgeon. He is president of the Paris University Air Club, and is the man who first conceived the idea of the Congress. Having organised it from beginning to end, he deserves congratulations for the remarkable success achieved by a year's very heavy work.

Midwives and Social Insurance.

The new law on social insurance should come into force in April, 1930, and those implicated are studying the effect it is likely to have on their work. Midwives, whose service will now be almost wholly paid for under the insurance scheme, are only now beginning to organise themselves, and it was not until last week that they set up their "syndicate" for Paris and suburbs, under the presidency of Mlle. Mossé. They are now trying to form a single national confederation with the other syndicates, some of which are already associated in local groups. In negotiating with the Government a national body has many and obvious advantages.

Cocktails.

That alcoholism is now commoner among the smart set than among the working classes was the assertion of Dr. Guillain, professor of clinical neurology, in a recent lecture before the Academy of Medicine. The noxious habit of taking cocktails before meals, now acquired by young women of the "best world" accounts, he said, for their developing disorders that before the war were the prerogative of the hospital classes. One must now go to the houses of the wealthy to find alcoholic polyneuritis, since only rich people can afford the price of highly toxic drinks. Prof. Guillain gave his colleagues some receipts for making the best-known cocktails, and the Academy concluded its deliberations by passing a resolution intended to draw the attention of the upper classes to the dangers of absorbing these poisonous substances. This and similar warnings lose much of their effect, however, through the non-participation of most of the newspapers, as they do not care to get into trouble with the "alcoholocracy" in this country, which is neither more nor less powerful than it is in the rest of the world.

The Last Influenza Epidemic.

The Société Médicale des Hôpitaux has had a special discussion on the forms of influenza observed during the recent outbreak in Paris. The pulmonary symptoms seem to have been much the same as in 1918–19, though less severe. Toxæmia was the real cause of death in many cases, in which the lesions found post mortem did not seem sufficient to explain the rapid termination of the illness. Dr. Hallé gave an interesting account of a family whose members reacted to influenzal infection by various different nervous symptoms, such as nystagmus, sialorrhœa, headaches, and mental confusion.

In the course of the discussion Prof. Netter expressed his view that influenza and encephalitis are separate diseases with their own viruses. He thinks that everything pleads for their separation though, of course, there is as yet no absolute proof of this.

Prof. César Roux, the celebrated surgeon of Lausanne, has been awarded the title of "Doctor Honoris Causa" of the University of Paris.

Dr. Lesné, of the medical staff of Paris hospitals, specialist in pædiatrics, and General Rouvillois, professor at the military medical school of the Val-de-Grâce, have been elected members of the Academy of Medicine.

IRELAND.

(FROM OUR OWN CORRESPONDENT.)

Health of County Galway.

THE Department of Local Government and Public Health has drawn the attention of the Galway County Board of Health to the advisability of recommending the county council to appoint a county medical officer of health, and has stated that the Board of Health would be incurring a grave responsibility if further postponement were permitted. It was further pointed out that the incidences of infectious disease was far too high in the county. During the past two years 70 cases of enteric fever and 184 cases of diphtheria had been reported from the County of Galway. These figures, which pointed to extensive disregard of proper sanitary precautions, were much in excess of other counties in the Irish Free State, and indicated the necessity for a centralised county control of infectious diseases. The money spent in maintaining institutions for the treatment and isolation of preventable disease would cover the cost of beneficial schemes for prevention of disease. In Connemara there was a chronic smouldering infection of typhus fever, with periodic outbreaks which exacted a heavy cost both in human life and in money. Modern sanitary methods would eradicate this disease, as had been done in other countries. During the year 1926 a widespread outbreak of encephalitis lethargica occurred in County Galway, about 100 persons being affected. Those cases were not reported to the Minister, and as there were no local facilities for coördinated supervision, a valuable opportunity for studying the disease and, perhaps, preventing further outbreaks, was missed. There was great need for the establishment of a system of medical inspection of school-children in County Galway, and the care of expectant and nursing mothers was awaiting attention. It was added that as the port of Galway was becoming an important centre for immigration and emigration, it was prudent that it should be under the supervision of an expert medical officer of health. After discussion the Board of Health referred the letter of the Department to the county council without making any recommendation.

Medical Certification of the Insured.

The National Health Insurance Commission has addressed a letter to the several medical certifiers, drawing their attention to an alleged laxity and irregularity in the issue of certificates of incapacity for work. It is stated that although in the year 1928 the number of insured persons in the Irish Free State was less by 26,000 than in 1925, the number of certificates issued rose from 831,000 in 1925 to 1,145,000 in 1928. At the same time less expenditure on sickness and disablement benefits rose from £410,000 to £562,000. The Commission states its opinion that, in the absence of any evidence other than the certificates to show a corresponding increase in sickness, the growth of expenditure is due largely to laxity in certification. In support of this view it is pointed out that of 20,000 cases referred for second opinions under the District Medical Referees Scheme in 1928, less than 40 per cent. were found on examination to be incapable of work. The Commission declared its intention of exercising a closer control over the work of the medical certifiers. An analysis is being recorded in regard to each certifier showing (*a*) the result of the testing of his certification by the medical referee, and (*b*) the result of a scrutiny of the blocks of the certificates issued by him quarter by quarter. These records will be borne in mind in deciding on the action to be taken when complaints are made against individual certifiers. It is added that, unless a substantial improvement is made in the standard of certification, the Commission will take the step of terminating the agreements with certifiers who refuse or neglect to comply with the terms of their contracts. Moreover, in any case in which a medical certifier may be found, after investigation, to have made a false or misleading statement in connexion with the issue of a medical certificate, the Commission will not hesitate to report the case to the Medical Registration Council.

It has, unfortunately, to be admitted that there is a certain amount of lax certification by medical certifiers. This is made the most of by certain officials of the approved societies who are anxious to obtain for the societies the right to provide certifiers under their own control, and, therefore, miss no opportunity of finding fault with the present system. The letter of the Commission appears to take an altogether exaggerated view of an admitted evil.

National University of Ireland.

Dr. Denis J. Coffey, President of University College, Dublin, and Vice-Chancellor of the National University, has been reappointed to represent that University on the General Council of Medical Education and Registration.

Registration of Dentists in the Irish Free State.

The Register of dentists set up by the Dentists Act, 1928, came into existence in the Irish Free State last week, and it is now illegal for anyone to practise dentistry in the area of the State unless his name is on the Register. The conditions of admission to the Register are similar to those for admission to the British Register.

SCOTLAND.

(FROM OUR OWN CORRESPONDENT.)

Care of the Feeble-minded.

THE Edinburgh District Board of Control some years ago purchased Gogarburn House and Estate, with 58 acres of land, and later added the adjoining estate of Kellerstain, with 361 acres. In 1923, when these transactions were carried through, financial stress hindered the immediate development of these estates as homes and colonies for the feeble-minded; but in March, 1927, the first sod of the service roads was cut. The institution will ultimately contain blocks of dormitories, laundry, stores, hospital, and additional staff quarters. Two dormitories, each with 50 beds, are completed and two more will be built. When the present scheme is brought to a close, there will be accommodation for 500 feeble-minded persons, and the plans permit of extension to 1000. The institution is meant to serve not Edinburgh alone, but all south-eastern Scotland. It is to provide for the detention of adult defectives and for educable children under 16 years of age, the usual occupations being provided. The entire scheme is expected to cost more than £400,000, about half of which will be borne by the Treasury.

An associated institution, on the same grounds, is in contemplation for the treatment of incipient insanity, but this is a separate scheme. The Glasgow District Board of Control has a large home and colony for feeble-minded at Stoneyetts, near Glasgow. The powers of the 1913 Mental Deficiency Act will now be more effectively applied. The reform in local government will no doubt affect the Gogarburn Institution for the better; but the present District Board of Control are to be congratulated on the measures they have taken in the last few years. The conception of a segregation colony has, thanks to the recent agitation by the Scottish Women Citizens, taken full possession of the official mind. The colony at the Royal Larbert Institution is being rapidly developed. All our institutions will obviously be needed, now hat we are learning more exactly the numbers of the feeble-minded. The familiar deliverances of several judges that they cannot deal with the feeble-minded because there are no institutions to send them to will soon be a thing of the past.

The New Principal of Edinburgh University.

The Principalship of Edinburgh University, rendered vacant by the retirement of Sir Alfred Ewing, which takes effect at the close of the present session, has been accepted by Sir Thomas Henry Holland, K.C.S.I., Rector of the Imperial College of Science and Technology, London. Sir Thomas is President-elect of the British Association, which is meeting this year in South Africa, and he is not expected to arrive in Edinburgh until about the middle of October. He is in his sixty-first year. Joining the Indian Civil Service in 1890, he held many important appointments in India before returning to this country in 1909 to become professor of geology and mineralogy in the University of Manchester, a post which he held until 1918. In 1915 he became President of the Institute of Mining Engineers; in 1920 he was appointed a member of the Governor-General's Council of India; and from 1924–25 he was Vice-President of the Royal Society.

Addressing the Summer School of Social Study at Rothesay, Dr. J. Parlane Kinloch, Chief Medical Officer of the Department of Health for Scotland, said he had reached the conclusion that the present arrangement whereby health visitors are required to devote their whole time to health visiting from the central offices of a health department and are largely divorced from actual nursing, is essentially bad. If the public health nurse and health visitor is to fulfil her function she must have clinical association and actual participation in nursing work, for unless doctors and nurses continually receive fresh inspiration by actual contact with medical and nursing work they are bound to become stale. Dr. Kinloch urged united action by the authorities of all the nurses' training schools to establish in each of the principal regions of Scotland a complete training school for health visitors and nurses.

At the annual general meeting of the Scottish Branch of the Smoke Abatement League on May 3rd Colonel P. S. Lelean, Professor of Public Health in the University of Edinburgh, mentioned an experiment carried through in the Warrender Park district of Edinburgh. In that area 4800 windows of flats occupied by an educated and good class of citizen had been kept under observation. It was found that in the summer only 1 in 12 windows was wide open, and only 5 in 12 were open at all. These were appalling figures, and showed the lack of education in public health matters.

In the thirty-eighth annual report of the Glasgow Royal Cancer Hospital it is stated that the ordinary income was £7668 and the ordinary expenditure £9527. Extraordinary income, &c., amounted to £7143. The report refers to the recent gift of £10,000 by Lady Burrell for the purchase of radium. In order to obtain the best results, the directors have decided to form a radium institute, and with that object have purchased a property adjoining the hospital. The institute will be under the supervision of a full-time medical officer, and will be available for the treatment of patients in Glasgow and the West of Scotland, whilst it is also hoped to be able to lend radium to other hospitals in the neighbourhood.

Dr. W. M. McAlister, deputy physician-superintendent of the Royal Edinburgh Hospital for Mental Diseases, lately spoke to the Edinburgh Soroptimist Club on the Modern Treatment of Mental Disorder. He pointed out that in every mental hospital about 70 per cent. of the population is a chronic population, which is a deplorable state of affairs. It is out of the apparently trivial disorders outside the asylums that such cases develop, and the remedy is not a simple one. Hitherto people have been content to see things growing, and then to step in and try to alleviate the damage. The real beginning of treatment lies in the formative years of the child's life. The treatment is not of an individual, but of a situation, and the aim is prevention before definite symptoms have arisen. To achieve this aim requires the coördinated help of social worker, health visitor, teacher, psychologist, and alienist.

Public Health Services.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

Barnstaple Rural District.

WE have received from Dr. J. R. Harper the first health report for the year 1928. The estimated population of his district was 19,180; the birth-rate was 12·9, and the death-rate 12·5. The 240 deaths included 122 male and 118 female. Twice as many females as males died from cancer and tuberculosis, the rates from these causes for both sexes combined being 1·56 and 0·78 per 1000 of the population respectively. On the other hand, there were 26 male deaths and 20 female from heart disease and 12 deaths of male infants to 2 deaths of female infants. The total rate for heart disease was 2·4 and the infant mortality-rate was 56·9 per 1000 births. Influenza was not so prevalent as in 1927 and only caused 2 deaths as compared with 17, the death-rate from respiratory diseases and influenza being only 0·8 per 1000 of the population. Schools in eight parishes were closed on account of measles in the early part of the year; one school was closed for 12 days for disinfection on account of scarlet fever; and one for eight days on account of chicken-pox. A maternal death-rate of over 8 per 1000 births was occasioned by two deaths, one of them from sepsis.

Dr. Harper refers to the need for the replacement of unsatisfactory cottages. The Housing (Rural Workers) Act is being utilised. The reconditioning of 13 houses was begun during 1928, and the work was completed in the case of three during the year. The County Council has approved two further schemes under this Act. Twelve new "subsidy" houses were completed during the year. The unsatisfactory water-supply at Combe Martin is being dealt with, and it is expected that the new water supply will be available for the village in 1929. The sewage outfall at Combe Martin is to be extended in order to prevent the deposit of sewage on the beach near low-water mark. Samples of milk are examined bacteriologically and the results communicated to the producers concerned. Grade A (T.T.) milk is produced on two farms in the district.

PORT SANITARY AUTHORITIES.

Hull and Goole.

Dr. W. Allen Daley, in his report for 1928, observes that the medical staffs of the city and port have this year been conveniently made interchangeable. In all, 7096 ships arrived and were inspected; also 1157 canal boats and 4431 fishing vessels. These latter, if on long-distance cruises to Iceland or the White Sea had generally better accommodation than had most ships for their crews. Of the ships, 888 had defects; these are separated into three groups: (*a*) defects of original construction, the most notable being no water service to the w.c., 33; (*b*) defects due to wear and tear, leaky ports, 169; leaky decks, 88; (*c*) dirt, vermin, &c., dirty forecastles, 547; verminous berths, 103; insanitary w.c.'s, 77. There were no cases of plague, cholera, yellow fever, smallpox, or typhus on any ship arriving. Opportunity for vaccination was offered to crews, but no application for it was received. Sanitary administration of the port cost £4511, of which £2152 was refunded by the Government. The water-supply of the port is from deep wells and is very pure; the tanks of 95 ships were ordered to be cleansed; in no case was there a written record on the ship of the origin of the water on board. Rats, 7522, were killed on board ships,

1150 ashore—a gratifying reduction of 35 per cent. in eight years. Ships are searched for evidence of recent rat-infestation (photographs are given); if there is no evidence, a "deratisation exemption certificate" is given; if less than 10 rats are suspected on board, a "deratisation by trapping certificate" is given, but if over 10, the ship is fumigated; in default of search, the ship must be fumigated every six months. Over 270 tons of food (imported) were condemned at Hull, but all received at Goole was sound. Aliens arriving were 7401; among the transmigrants 90 were certificated for trachoma, favus, and similar conditions.

Port of London.

In his report for 1927, Dr. W. M. Willoughby mentions that in all 23,233 ships were examined. The latrines of the port have been increased by some 260; a new infectious pavilion was added to the Denton Hospital at Gravesend. The Ministry of Health suggested it might be well to inoculate seamen on the way to the Persian Gulf against cholera, and 137 were so immunised. Schick-testing and immunisation is thought to have freed one training ship from diphtheria, and another, it is hoped, will follow suit. No case of human plague was seen, but 35 dead rats were reported on board a grain ship from South America; of these five were found plague-infected, two brown, three black. The ship was twice fumigated with hydrocyanic acid—once when half-discharged 291 rats killed, and a second time with the holds empty, five found. Small-pox was brought on board a ship at Calcutta on Dec. 7th by a man who developed the disease on the 14th, and died on the 24th. The ship's crew, all but one man who was overlooked, were vaccinated at Suez; no one else but this one missed man took small-pox; he became ill on Jan. 8th, 14 days after the death of the first case. On ships 12,897 rats were destroyed, ashore in the port 11,395; only the five mentioned were plague-infected. There appears to be most confidence in hydrocyanic acid fumigation which kills fleas even quicker than rats. Of unsound food 1813 tons were destroyed or specially dealt with; of 60,659 beef tongues particularly examined, 2 per cent. were found affected with actinomycosis. The chief nuisances detected on ships were: dirty quarters, 1218; leaks in quarters, 102; defects in lighting, 94; in ventilation, 81; in heating, 62; in sanitary conveniences, 47; and 50 crew spaces were verminous. Of venereal disease 133 cases were reported among crews on arrival. It is noted that the total number of cases of infectious disease reported is decreasing, a possible result of greater attention paid in foreign ports.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED MAY 11TH, 1929.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 277 (last week 356); scarlet fever, 2166; diphtheria, 966; enteric fever, 37; pneumonia, 1407; puerperal fever, 49; puerperal pyrexia, 126; cerebro-spinal fever, 25; acute poliomyelitis, 2; encephalitis lethargica, 25; continued fever, 1; dysentery, 9; ophthalmia neonatorum, 101. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the Metropolitan Asylums Board on May 14th-15th was as follows:—Small-pox, 292 under treatment. 15 under observation (last week 338 and 12 respectively); scarlet fever, 1501; diphtheria, 1636; enteric fever, 11; measles, 117; whooping-cough, 943; puerperal fever, 24 (plus 12 babies); encephalitis lethargica, 109; poliomyelitis, 4; "other diseases," 61. At St. Margaret's Hospital there were 15 babies (plus 6 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was 1 death from small-pox, 4 (0) from enteric fever, 57 (1) from measles, 6 (1) from scarlet fever, 83 (28) from whooping-cough, 24 (3) from diphtheria, 48 (9) from diarrhœa and enteritis under two years, and 79 (7) from influenza. The figures in parentheses are those for London itself.

The death provisionally classified to small-pox was assigned to West Ham C.B. A second death provisionally assigned to Rochdale C.B. was omitted from last week's return. No great town reported more than 3 deaths from influenza except Manchester with 7 and Bradford with 4. Liverpool reported 15 deaths from measles, Birmingham 7, and Sunderland 6. The mortality from whooping-cough is now diminishing, although Liverpool reports 5 deaths, West Ham, Birmingham, and Manchester 4 each. No great town reports more than 3 deaths from diarrhœa.

The number of stillbirths reported during the week was 327 (corresponding to a rate of 47 per 1000 births), including 65 in London.

Parliamentary Intelligence.

HOUSE OF COMMONS.

WEDNESDAY, MAY 8TH.

WAR PENSIONS ADMINISTRATION.

On the report of a vote of £32,723,500 for the salaries and expenses of the Ministry of Pensions,

Major TRYON, Minister of Pensions, said that the vote of the Ministry was still nearly the largest single vote of all the civil estimates. The Ministry's work affected the weekly budget of nearly a million families and the actual beneficiaries of the Ministry numbered a million and a half—a larger number than had been reached under any pensions system in this country. At the end of the current year they would have spent since the beginning of the war—i.e., during the past 15 years—no less than £913,000,000 on war pensions. By comparison with that sum France would have spent not more than about £500,000,000, and Germany but little more than about £400,000,000. Our expenditure on war pensions had therefore been roughly equal to the expenditure of both France and Germany together. The reason was that our scales of pension were considerably better than those of France and Germany. For example, a disabled man with a 50 per cent. pension—about the average pension rate—drew under the British pension system £52 a year for himself, and a 50 per cent. pension would be never less than £52. In France the same man would draw £23 a year, including a variable bonus. In Germany he would draw £18 a year, including a bonus. This country was prompt to adjust pension scales to meet enhanced prices so that, whoever suffered, the pensioner should not. Other countries did not take this course, and the pensioner suffered; and it was only since those countries had given up the policy of inflation of prices and had attained a stable currency that they had begun to adjust the scales of pension to the altered cost of living. In strict financial theory this country should have been bringing our pension rates down as other countries were just beginning to increase theirs, because our cost of living had gone down steadily since 1919, but the Government decided that pensioners should not suffer a reduction of the scale of pension to which they had become accustomed for years and they decided to stabilise the existing scales of pension.

The estimated expenditure of £53,000,000 represents a decrease of nearly 3½ millions on the estimate of the preceding year. This at the present stage is a normal decrease. It would not last because the principal factors of that decrease were gradually ceasing to operate. The expenditure would, in fact, very shortly show no more than a fall of little more than 1 per cent. a year, and he estimated that over the next ten years the mean expenditure would be about 45 millions a year. But, taking the course of expenditure for the last five years, including the year in which the Labour Party were in office, there had been an annual decrease in the expenditure amounting on an average to round about 3 millions. Indeed, the actual (not the estimated) expenditure of last year showed exactly the same decrease, namely, about 2¾ millions as occurred in his predecessor's year of office. The decreased expenditure was the result of a decline in practically every item of the Bill—administration, medical services, pensions, and allowances. The administrative machinery of pensions would cost this year £1,231,000. There was still a decline in this item of our expenditure. Though naturally enough it was tending to stabilise, there would still be the substantial decrease of 6½ per cent. on the previous year's figure. They were still spending on administration no more than 5½*d.* to every £ of expenditure on benefits to pensioners, as compared with 1*s.* 3*d.* in 1920, the first year of his association with the Ministry. The staff showed a decline in numbers corresponding with

the diminution in the volume of work. At March 31st last the staff numbered 6608, a decrease of 800 on the previous year. Roughly one-third of the number consisted of female staff, of whom a large number were employed as nurses in Ministry hospitals; 4100 were men, of whom 96 per cent. were ex-Service men. In pensions and allowances, which accounted for 94 per cent. of the Ministry's expenditure, they would spend this year £50,798,000 for a pension list of, roughly, 950,000 adult pensioners and their dependents. Of the total £27,300,000 went in pensions and cash benefits of all kinds to disabled officers and men; and £23,400,000 to the widows and dependents of officers and men who had lost their lives in consequence of war service. There were, of course, still factors operating in the direction of increased expenditure, but on the whole the net result was a declining expenditure.

Medical Services.

There were two sides of the medical service attached to the Ministry, first, the medical examination for pension purposes, and, secondly, the work of medical and surgical treatment. The medical examination, or boarding, of pensioners for the assessment of their pensions was rapidly diminishing. The bulk of the work was now directed to the making of final settlements or final awards in all suitable cases. He was continually pressed to settle pensions finally both by the men themselves, at meetings in the country, and by Members of that House. The security which these final awards brought was being appreciated as they knew it would be. There were only about 100,000 cases still drawing pensions that were temporary and subject to further review. Their present lines of working were calculated to complete in a few months time practically the medical boarding of all these cases, so far as they were likely to be found suitable, for final award. For many of the men it would probably be found impossible and unfair in their own interests to give final awards, at any rate yet if at all, because they were cases that were actively deteriorating. But for the bulk of cases he hoped that finality might be reached before the present year ended. The other side of the Ministry's medical work consisted of the medical and surgical treatment of cases. The demand for treatment of all kinds continued to show the same decline year by year as had occurred for the last seven or eight years and the hospital accommodation of the Ministry had, of course, been reduced proportionately. The Ministry was still maintaining 17 hospitals of its own with approximately 3000 beds, and had a call on 25 other hospitals under the control of voluntary bodies which reserved their entire accommodation, or the bulk of it, for the Ministry. These provided accommodation for a further 2000 cases. In addition the Ministry made use of civil hospitals to a substantial extent. The number of patients in the Ministry and civil hospitals on March 31st was 5106.

He had taken every possible step to ascertain that the pension system was working justly and adequately, and he had abundant testimony to the fact that the system, as a whole, was working soundly. The time limit was a remarkable example of the unanimity of the three political parties when in office on the subject of war pensions. It was imposed on medical advice in 1921 under a Liberal Prime Minister and a Liberal Minister of Pensions. It received the unanimous approval of that House in the 1921 Act. It was upheld by the Government of Mr. Bonar Law. The Labour Party had promised to remove it, but when in office they not only proposed no change in this House, but maintained it in individual cases which were already arising. The principle was again carefully considered by the present Government, who decided that it should be maintained. In imposing a time limit they had done what every other country had done which enrolled its men in the late war by universal service on British lines. Every country had imposed restrictions of one kind or another on the meeting of claims for disablement by war service as a right for an indefinite period. At the same time they had done what every other country had done in applying this limit. They had qualified the rigid time limit by a procedure for the admission of exceptional cases which could prove that they were genuine cases of war disablement. This qualification had been the work of the present Government. In the small number of exceptional cases of genuine war disablement arising after the time limit he had made special arrangements for examination and if necessary hospital treatment. Between 300 and 400 cases that had arisen beyond the seven years' limit had been pensioned. If the time limit was thrown down it could only throw discredit upon the whole pension system. The system of final awards —the principle of a final settlement of the compensation due for every officer's or man's disablement, wherever that could fairly be arrived at—as it had been worked during the eight years by Ministers of Pensions of all political parties would by the end of this year have brought complete security of their pensions to nearly 500,000 officers and men. The Ministry had adopted the system of correction of error, by which any officer or man who had received a final award, but who subsequently was found to need hospital treatment and who, at the end of his course of treatment was found to be in a condition of disablement which was seriously at variance with the degree of disablement which had been assumed for the purposes of final settlement, could be, and was given further pension. In taking the basis of treatment as both the channel for the discovery of error and the test of its existence, he was satisfied that both his predecessor and he had acted wisely, because medical observation and treatment gave, as they alone could give, a basis of ascertained fact to the existence of error. It had been suggested that, notwithstanding that he had a right of appeal to an independent appeal tribunal within a full 12 months of his award, every man who had had a final award should be given a further right to appeal at any time and an indefinite number of times. Any such proposal must make an end of final awards.

Village Centres.

Mr. F. O. ROBERTS said that a great deal had been done by those charged with the responsibility of dealing with tuberculous men, but he would like to know whether the Ministry had given any consideration to the widening of the scope of operations of village centres which could meet the typical cases of ex-Service men which arose from time to time. The British Legion had a very definite policy on the matter, and from the results which had followed the treatment of cases which had come within their hands and the investigations they had made there seemed now some justification for the conclusion that the proper way of dealing with tubercular ex-Service men was to find a means of giving them some useful work under the most congenial and comfortable circumstances. The neurasthenics were probably the most difficult of all the cases with which the Ministry was called upon to deal, but it was a difficulty which ought to encourage those responsible for administration to even greater efforts in the future with the object of overcoming the difficulties. He urged the need for setting up greater and wider occupational opportunities for dealing with this particular type of patient. Certain avenues had been traversed in this direction, but the best opinion had now come to the conclusion that it was only by finding congenial occupations for these patients that they could hope to do anything to bring them either to a complete recovery or to that partial state which would enable them to lead a happier life. On the general question of treatment Mr. Roberts said that he understood that it took from three to six days before a man who had applied for treatment received a visit from the Ministry's medical officer. He urged that some arrangement should be made to avoid the delay and difficulty which must constantly arise. The men might be attended by local doctors on the production of the award showing that the disability had been accepted by the Ministry of Pensions. He appealed for a continuance of the human touch with pensioners without which none of the exceptional cases were likely to be adequately met.

Post-war Diseases.

Dr. VERNON DAVIES said the House was to be congratulated upon being able to deal with the subject of pensions purely from the non-party point of view. The medical profession was intimately concerned with the question whether justice was being meted out to ex-Service men. When all was said and done it depended upon the skill and accuracy of diagnosis and assessment of the medical profession as to whether any ex-Service man could make a case or not. The doctors had to hold the scales of justice with an equal poise, remembering on the one hand the taxpayer and on the other the pensioner. But they were all agreed that in any case of doubt the pensioner should receive the benefit of it. It was easy, however, to make a mistake, and he would explain to the House, roughly, what he meant. There was a certain class of case which everybody—layman as well as medical man—would recognise as simply due to war injury, such as the loss of an eye, the loss of a limb, or a gunshot or shrapnel wound. There was a second class of case which they were quite convinced was not due to war injuries. Because a man had been in the war it did not necessarily follow that every illness and injury he got was the result of his war service. Such cases as these, therefore, cases which were genuine from their knowledge and cases which were not genuine from their knowledge should not arise. Medical men with a certain amount of experience were equally as certain in other classes of case whether they were due to war injury or not. Members had letters from ex-Service men, apparently very sad cases and perhaps cases of paralysis. A man would say that he was perfectly all right when he went to the war and after five or six years he developed a certain form of paralysis and thought that it must be a case of injury or shock or nervous stress due to the war, but medical men knew that that paralysis was definitely the

result of venereal disease. Nothing could cause that paralysis but venereal disease, and therefore they said that it was not due to the war. The medical man by his knowledge was able to give an accurate diagnosis but the layman or the laywoman did not recognise this and thought that injustice had been done. There was a third class of case, the doubtful case even from the point of view of the medical man. Medicine was not an exact science. They were not yet masters of all disease; they did not always know the cause of disease or the prognosis of disease. They had, therefore, a neutral ground where there was room for difference of opinion. What was the proper and right thing to do in that debatable ground? It was to see that they had the highest, the best, and the most competent medical advice before confirming an opinion because they could only depend upon medical advice when they had to decide on the question of entitlement and assessment. People had wondered sometimes whether the Ministry had acted quite as leniently as they might have done, and whether they had been as humane as they might be. He paid, however, a tribute to the kindness and humanity of the Minister who had offered him the opportunity of interviewing any of his medical staff and had arranged a meeting with the Director-General of Medical Services in the Ministry and his deputy. The medical department of the Ministry had three main duties. First of all, they dealt with the boards and the assessment and entitlement of a man's award from the medical point of view. Secondly, they dealt with certification and the necessity of treatment or treatment allowances. Thirdly, there was a non-medical branch which dealt with the supply of hospital apparatus, artificial limbs, &c. Dr. Davies proceeded to describe in detail the procedure followed by the medical boards and officers of the Ministry, and he said that he had satisfied himself that the greatest skill and medical attention was given to cases under review by expert medical men. The medical men attached to the Ministry were absolutely fair and unbiased and anxious to do the best for the ex-Service men. He had come away from a very long interview with the Director-General of Medical Services and his deputy perfectly convinced that the medical department of the Ministry were more than fair to the ex-Service man. Speaking as a medical man, he (Dr. Davies) would not have passed some of the cases which they had passed. He would give an example of a man who had syphilis before the war, and after the war developed symptoms of general paralysis of the insane which came on perhaps a little sooner than might have been expected. The Ministry accepted that as a case in which there had been aggravation due to war service, but he (Dr. Davies) would not have accepted the case. They might have the case of a man who went through the war at somewhere round about 50 years of age, and since then with the advance of years had developed, say, arterio-sclerosis. That man had a stroke and got paralysis. Some people would say that such a case should be accepted as due to war service and the man be pensioned accordingly. He was glad to find in that particular case that the Ministry did not regard it as one where the disease had been aggravated. If they could get the idea to prevail throughout the country that the medical profession were a body of honourable men anxious to do all they could for the ex-Service men it would create a better spirit and a better atmosphere and reduce the amount of suspicion. It was not uncommon at the present time to hear it said, "But it is quite easy to get a doctor on one side to say one thing and another doctor on the other to say exactly the opposite." Members of that House must recognise that in surgery and medicine they had not reached the confines of knowledge and one man might with perfect honesty interpret a symptom in a certain way and the next man might with equal honesty interpret that same system in a different way. Very often they did not know which man was right until there was an operation or a post-mortem examination. When it was said that cases have been referred to the Ministry accompanied by certificates from doctors that did not necessarily mean that those medical men gave a false certificate. They gave a certificate according to the best of their ability on the symptoms they had observed, but when they had the opinions of experts—experts on tuberculosis, or neurasthenia, or insanity, or wounds—it was only fair to regard the experience of such an expert with all his experience as of more value than that of the ordinary practitioner. He was always prepared to take the view of an expert whether he agreed with him or not because he felt he had more knowledge.

Mr. KELLY said that while he was prepared to accept the statement of Dr. Davies that the main body of doctors were honourable men, he suggested that mistakes might be made even by experts and specialists. He was not at all sure that they could rely, or must rely, in pension matters upon the certificates handed out by medical men. They had experience of cases under the Workmen's Compensation Act where medical opinion had been accepted by the Court as sufficient to determine whether a man was capable of doing his work. He did not think that it was the function of a doctor to say whether a man was capable of doing his work, and judging by many cases their opinion was not worth a great deal.

Decline in Surgical and Medical Cases.

Lieut.-Colonel FREMANTLE said that with regard to the medical side of pensions administrations he would draw attention to the fact that while a very extensive amount of work in connexion with surgical and medical cases had been done in the Ministry's institutions, there was a very definite decline in the provision made and in the necessity for it, and he wished to know the direction in which this was leading. The number of g neral surgical cases dealt with by the Ministry had gone down from 2500 at the beginning of 1925 to something like half that number. In a period of just over four years the total number of surgical cases treated had been 64,000, and of medical cases 60,000, while there had been 26,000 neurological cases. Outside the Ministry of Pensions very few people realised the tremendous experience of neurological treatment that had been thus gained. It had been a source of information of immense value to medical science generally and for treatment in civil life hereafter. Now, however, naturally enough, there were fewer cases demanding fewer institutions and smaller staffs. The number of institutions had been reduced from 250 in 1921 to 28, the number of hospitals had been reduced from 75 to 20, the medical staff from 560 to 150, and the nursing staff from 1300 to 360. He would like to know what steps were to be taken to see that all this wonderful equipment and experience was going to be made proper use of. The difficulty of a service of this kind was that, as it dwindled more and more so the resources became more limited and it became difficult to give the same proper and suitable treatment to those patients who remained and to give the same kind of outlook in the service for those who were employed in it, while at the same time valuable equipment, institutions, and services were being lost which might otherwise be used for the general good of the community. He entirely agreed with Dr. Vernon Davies that undoubtedly the medical men who were doing the very difficult work of assessment were *sans peur et sans reproche*; but he had not the same absolute and unremitting faith as his hon. friend apparently had on the results of the judgments of the medical profession. They were all of them liable to make mistakes, even when there might be two or three of them together, and his own experience was that when cases were brought before the Minister in which there appeared to have been any error of judgment even in the higher courts they found themselves satisfied with the action that was taken. Obviously there must be protection for the public; there must be a limit. He believed that as much latitude as possible was given in individual cases, and he supposed they must recognise that while there were cases among their constituents with which they naturally felt sympathy, nevertheless it was a fact that the line must be drawn somewhere.

Reply to the Debate.

Major TRYON, replying to the debate, said that he greatly appreciated the references to the medical service of the Ministry made by Dr. Vernon Davies. He (Major Tryon) admired and respected the works of the medical staff himself and he resented attacks—not in that House—against the doctors of the Ministry of Pensions. An enormous proportion of the medical staff had been in the Army and had served overseas. Very often the man who was applying had not been overseas and the doctor who was examining him had. He thanked Colonel Fremantle for the very interesting points he developed. There were, however, a certain number of subjects on which the House was handicapped because they concerned a number of departments. That applied to the very interesting points which Colonel Fremantle had dealt with.

The Report of the Vote was agreed to.

DONATIONS AND BEQUESTS.—Sir William John Lancaster, of Putney Hill, S.W., in addition to other charitable bequests, left £500 each to the West Norfolk and Lynn Hospital, King's Lynn, the Bolingbroke Hospital, Wandsworth Common, and the Putney Hospital; £100 each to the Royal Hospital for Incurables, Putney, and the Hunstanton Convalescent Home.—Mr. James Stewart Williamson, of Auld Girth, Victoria Park, Manchester, left, among other bequests, £1000 each to the Manchester Royal Infirmary and St. Mary's Hospital, Manchester, and £500 to the Christie Hospital for Cancer, Chorlton-on-Medlock.—Mrs. Fanny Hester Wright, of Crescent House, Southsea, Hants, left £1000 to the Hospital for Sick Children, Great Ormond-street, W., for a cot to be called "The Mickle's Bed."

Correspondence.

"Audi alteram partem."

BLOOD STANDARDS.

To the Editor of THE LANCET.

SIR,—Difficulties with regard to blood standards and with regard to the accuracy of the methods employed must have been felt by everyone who examines blood. Fortunately in the practical application of blood examination for diagnosis, experience shows that the variations in many diseases are in general greater than the sum of all the experimental errors; thus the diagnosis of an inflammatory reaction, as in the presence of pus, will be made by different observers using different methods, and perhaps on counts showing considerable differences. Again, in watching the progress of a case—for example, pernicious anæmia—the fact that successive counts will often be made by the same person using the same method eliminates many experimental variations.

Difficulties must always arise whenever an arithmetical figure is fixed as standard for a varying human characteristic. Consider such simple measurements as those of stature or weight in which there need be no experimental error to be considered. We should not ask what is the "normal height" of, say, adult male human beings, but either what is the "average height" or what are the "normal limits of height," and any figures given for the latter, however elastic they might be, would still be difficult to defend against cross-examination in a witness-box. What we want to know with regard to blood standards for practical or even scientific purposes are not hard-and-fast fixed figures, but rather the various normal limits in order that we may judge what is abnormal. Unfortunately the problems of blood are further complicated by the experimental variations and errors of different instruments and methods of calculation.

With regard to the *total red cell count*, it is surprising that the figure of 5,000,000 per c.mm. can have endured so long in this country. But I remember discussing this point with Pappenheim before the war, and remarking on the higher counts constantly found in Great Britain. To my surprise he defended the figure strongly and stated that 5,000,000 was a correct average for healthy young males in Germany. In this country for a moderately selected group of healthy adult males I would put the figure at 5·5 to 7 million, usually between 6 and 6·5 million; for a group without selection, but no special ill-health, about 0·5 million less throughout.

The *hæmoglobin standards* are even more difficult owing to variations in the instruments. There is a further serious difficulty in that all measurements of hæmoglobin involve matching tints, in which the male sex is notoriously inefficient. This factor may be the explanation of the great differences obtained with the Haldane hæmoglobinometer by Dr. Goodhart and Dr. Jenkins respectively; it is also noteworthy that Dr. Jenkins gets higher readings with the Tallqvist scale than with the Haldane, although the latter is set to the lower standard. Different methods may suit different visions. Personally I always use the Dare instrument. I prefer the principle to Haldane's as several readings can be taken on the same specimen. In a recent test I made the hæmoglobin of a healthy male 92 per cent. on the Haldane instrument and 101 per cent. on the Dare as the mean of several closely similar readings. My standards had just been passed as accurate by a well-known firm which sells these instruments, and both the Dare and Haldane instruments are set to the same standard of hæmoglobin per 100 c.cm. of blood. I find that an inexperienced observer with the Dare instrument usually starts with a reading about 10 per cent. too low and corrects it after a few tests. Clearly it would be an advantage to have all hæmoglobinometers set to a common standard. Even this would leave those variations which are due to differences of vision, and also, no doubt, to differences in various instruments.

Dr. Dyke has mentioned the "hæmoglobin coefficient" of Osgood. According to this "Hæmoglobin is expressed as the number of grammes per 100 c.cm. of blood calculated to a red cell count of 5,000,000." Investigation shows that this "hæmoglobin coefficient" is given by multiplying by the colour-index the number of grammes of hæmoglobin accepted as the standard. Thus on a Haldane instrument, which is calculated to a standard of 13·8 grammes of hæmoglobin per 100 c.cm. of blood, any blood with a colour-index of 1 will give a hæmoglobin coefficient of 13·8. Obviously the "hæmoglobin coefficient" is only a more complex statement of the colour-index and gives no measure of the percentage of hæmoglobin. Osgood may have overlooked this simple resultant of a complicated calculation.

Normal White Count.—In reading Dr. Dykes's article I was especially interested on coming to a section headed Normal White Count, and was disappointed on turning the page to find that the article finished in a few brief lines. The difficulties are very great in arriving at any normal limits, for apart from true variations we must recognise the large experimental variations and errors of our methods. Suppose a blood actually contains 6,000,000 red cells and 8000 white per c.mm., how near are we likely to get in the count, and how far will a series of counts agree with each other? No doubt we would like our students to believe that we could get within 100,000 of the red and 100 of the white. Probably a more correct statement of the range is 10 per cent. of the total count, and not less than ± 100,000 for reds and ± 100 for whites, excluding extreme counts. Thus for 6,000,000 reds the range would be from 5,700,000 to 6,300,000, and for 1,000,000 reds from 900,000 to 1,100,000.

But the difficulty is far greater with the *differential count* of leucocytes. It is well known how erratically the various cells are distributed on a slide. There are wide differences between the distribution at the edges and the centres and at the ends. Some years ago a team of experienced laboratory workers attempted to investigate this question systematically. The differences which they obtained between different methods and between each other may be judged from the title of the article in which they recorded their results: "Have Differential Leucocyte Counts any Value?" Considering differential counts, I believe that for a series of counts of 500 cells on the same blood the range of variation for a cell is about the square root of its percentage. If the percentage of polymorphs is 64 various counts will lie between 60 and 68. For counts of 200 cells the range is about half as much again. Supposing a blood has correctly for polymorphs, lymphocytes, large hyalines (large mononuclears), and eosinophils, percentages of 64, 25, 9, and 2 respectively, the range of a series of counts of 500 cells will lie approximately without fractions, between 60, 27, 10, 3, and 68, 23, 8, 1, and for a series of counts of 200 cells between 58, 28, 11, 3, and 70, 22, 7, 1. No count ever reaches the accuracy of a decimal point, though perhaps for convenience 0·5 may be admitted for mast cells and eosinophils.

In spite of all difficulties some standard of normal limits for the differential count must be set before students and kept before ourself for comparison. I would suggest the following: Polymorphonuclear neutrophils 60 to 75, eosinophils 2 to 4, mast cells 0 to 1, large hyalines (mononuclears) 4 to 8, lymphocytes 15 to 35. The great difficulty is the limits of the neutrophils. Many good authorities would put the lower limit at 50. During the war counts between 50 and 60 per cent. were extremely common, but possibly these were not entirely normal. Of course the total count of leucocytes must always be taken into consideration together with the differential count when questions of abnormalities arise. For this reason the students at St. Bartholomew's are taught from the outset to calculate the total number of each cell

and compare them with the normal total numbers. This is quite rational, but used as a routine must involve much unnecessary calculation.

Coagulation Time.—The standard of this has not been referred to in the discussion, but it is greatly in need of consideration. Recent work, especially that of Christie in Edinburgh, has shown how greatly and constantly the coagulation time varies in the first few drops. After the third drop a normal coagulation time at 37° C. is under a minute and may be under half a minute. At 25° C. the time is sufficiently lengthened to be a nuisance. Possibly a temperature of 30° C. would give a coagulation time long enough to be accurately estimated in various circumstances without being tediously prolonged.

I am, Sir, yours faithfully,

London, W., May 10th, 1929. H. LETHEBY TIDY.

THE NEW IMPORTANCE OF RADIUM.

To the Editor of THE LANCET.

SIR,—In reply to Dr. Douglas Webster, I should not like to be misunderstood. I have not forgotten the valuable pioneer work done by Prof. Lazarus Barlow, Prof. Sidney Russ, and Dr. Webster at the Middlesex Hospital with radium en masse, but when I referred in my letter to distant "bomb" therapy I had in mind something rather different from half gramme surface application.

I am, Sir, yours faithfully,

London, W., May 17th, 1929. C. GORDON-WATSON.

Dr. A. E. Barclay writes to express regret for the omission in his letter which appeared last week of any allusion to the exceedingly good work in the radiation treatment of cancer done at St. Bartholomew's Hospital.

PATHOLOGICAL POSTURES.

To the Editor of THE LANCET.

SIR,—The questions raised by Dr. Brain indicate that in criticising certain forms of appeal to phylogenesis I have not made my position quite clear, and I am glad of the opportunity of stating the case more precisely. Dr. Brain's proposition that "there is nothing inconsistent between a physiological and a biological explanation" is surely a truism, since the former is necessarily the latter. My complaint is against a biology that is not biological; in short, against the clothing of what is, in fact, pure allegory in the language of biology. The comparison of the mobile spasm of athetosis with the hypothetical tree-climbing antics of our ape-like ancestors is neither more nor less than this. There is not even the degree of superficial resemblance between the movements of athetosis and those of a monkey climbing a tree necessary to lend an air of plausibility to this fantastic analogy. Further, in the observed behaviour of the decerebrate sloth we have an indication that Dr. Brain's interpretation of the flexed arm of hemiplegia is in all probability a figment of a like order. Therefore, what was spoken of as "the appeal to phylogenesis" in the lecture criticised by Dr. Brain might more accurately have been styled "the allegorical method in neurology."

On the other hand, the conclusion that certain tonic reflexes seen in the human subject with spastic hemiplegia are physiologically identical with postural reactions observed and described by Magnus and de Kleijn, rests upon no such insubstantial basis of speculation. It is not an explanation of a present, of which we know something, in terms of a past of which we know nothing, but it is the fruit of a careful correlation by numerous observers of facts of experimental and clinical observation.

Having accepted the physiological relationship of two groups of phenomena upon a sound observational basis, we may—if we will—proceed to consider the possible phylogenetic significance of our findings. To such a rational sequence of steps in investigation there cannot be, nor have I raised, any objection. But I cannot accept Dr. Brain's suggestion that conclusions so reached constitute "a phylogenetic explanation" of the same order as are the allegorical examples I have cited. The fact is that, although using the same terminology, we are not speaking the same language.

Reduced to its simplest terms, the position that I was endeavouring to maintain in my lecture, and that Dr. Brain is in effect disputing, is one expressed by Bacon in the proposition: Non fingendum, aut excogitandum, sed inveniendum, quid Natura faciat aut ferat.—I am, Sir, yours faithfully,

London, W., May 18th, 1929. F. M. R. WALSHE.

THE FREQUENCY OF RED HAIR.

To the Editor of THE LANCET.

SIR,—Some years ago (THE LANCET, 1922, i., 1270) you were good enough to print the casual fact that in 1921 nine of the 750 (1·2 per cent.) graduands of the University of London were red-headed; in 1922 there were 16 in 961 (1·7 per cent.). To my surprise I learned the other day that someone had found a use for these numbers. It is therefore perhaps worth recording that the tedious splendour of degree-day this year revealed six in 1157 or 0·5 per cent., a doubtfully significant decline from the older figures.

I am, Sir, yours faithfully,

Radlett, Herts, May 21st, 1929. A. E. BOYCOTT.

THE EYE AS A DANGER SIGNAL OF DENTAL SEPSIS.

To the Editor of THE LANCET.

SIR,—I shall be obliged if you will make a correction in your report of the paper read by me at the International Congress of Military Medicine on Friday, May 10th. I said that in an unexpected number of persons between the ages of 20 and 40 years slight opacities of the lenses are found, and that in a large proportion of these I attributed the cause to the marked dental sepsis which was present. Also I said that I found that in a consecutive series of 100 patients who came for refraction, and who attained full visual acuity with glasses, 22 showed radiographic evidence of the presence of apical abscesses.

I am, Sir, yours faithfully,

A. F. MACCALLAN.

Welbeck-street, London, W., May 20th, 1929.

MILLER GENERAL HOSPITAL, GREENWICH.—On May 14th the new extensions to this hospital were opened by the Duchess of York—three new wards, two complete operation theatre units, new kitchens, and a nurses' home. The total cost of the extensions is in all about £118,000, of which £29,000 is still lacking. The President of the hospital, Lord Queenborough, welcomed the Duchess, and drew attention to the wide area served by the hospital. Dr. Harold Pritchard, the senior physician, detailed the 16 specialised departments of the hospital, and singled out for special praise the work of the Lady Almoner's department in befriending the patients and ensuring after-care.

RADIUM IN LIVERPOOL.—At a meeting held in Liverpool Town Hall on May 14th, presided over by the Lord Mayor and addressed by Lord Derby, it was resolved to make an appeal for funds to purchase radium for the treatment of cancer and to establish a radium institute in Liverpool. The sum aimed at is £120,000. The Radium Committee is said to be representative of all the big hospitals in the city and has worked out details of the scheme. The amount of radium in Liverpool is at present very small and many patients have to be sent to Manchester, where is often a long waiting list. Lord Derby suggested that the Radium Fund should be Liverpool's thankoffering for the King's recovery, and this suggestion has been adopted.

Obituary.

ARTHUR HENRY CHEATLE, C.B.E. F.R.C.S. ENG.,

AURAL SURGEON TO KING'S COLLEGE HOSPITAL.

As we have already announced, the death of Mr. Arthur Henry Cheatle, aural surgeon to King's College Hospital, occurred in London on Saturday, May 11th, in the sixty-third year of his age.

Arthur Cheatle was the son of the late George Cheatle and younger brother of Sir Lenthal Cheatle. He was educated at Merchant Taylors' School, and joined the medical school of King's College, whence he took the double diploma of the English Colleges in 1888, and the F.R.C.S. Eng. four years later. He was elected assistant surgeon to the hospital, and from that time forward had charge of the aural department, lecturing on aural surgery, and later being definitely appointed aural surgeon to the institution. He rapidly proved himself to be a pioneer along the pathological and operative lines which his duties placed before him, for it must be remembered that not till the beginning of the present century had the modern surgery of the ear been either reasonably planned or indeed devised. The results of a spread of infection from the middle ear to structures where absence of surgical relief meant a fatality, but where, at the same time, operative interference was perilous, became recognised about the period when Cheatle took up his practical duties, and from that time forward his name was associated with many fine developments in theory and technique. He showed how the clinical features and progress of infection of the middle-ear tract were influenced by the anatomical type, so that chronic suppurative middle-ear disease had its origin, though indirectly, in a normal anatomical structure. When the mastoid operation was introduced, many surgeons were without precise knowledge of the anatomy of the cavities as they are influenced by the individual development of the subject, by age, and even by sex. In the Royal College of Surgeons of England there is housed a collection made by Cheatle, over a period of 30 years, consisting of a series of some 700 preparations displaying the structure of the mastoid region in its varieties, and demonstrating the influence manifested by the factors of individuality, sex, and age. In this collection, the most complete that has ever been made to illustrate the surgical anatomy of the middle ear and the accessory air sinuses, every specimen was obtained from a subject of known age and sex, and the descriptive catalogue, prepared by the collector himself, is now published by the College for the use of those who come to study the work from all parts of the world. Under Cheatle's supervision about 200 of these specimens were photographed and a series of lantern slides prepared to meet the needs of teachers. Such work alone entitles Cheatle to the grateful memory of his profession and of the public.

The following has been received from D.M., and shows the position which Cheatle occupied in the minds of his co-workers. D.M. writes:—

"Arthur Cheatle's death has removed from the small and rather select band of the scientific otologists of Britain a mind that can ill be spared. Not that his life's work was incomplete, for he was granted time to finish what he had originally set his hand to; but in a branch of medicine in which, for several reasons, the practitioner is exposed to a daily temptation to forsake at times the narrow path of unpleasant truth, Cheatle knew no deviation, no hesitation even. And in the wider world, when easy roads to distinction in a popular sense were indicated to him, he would smile and take his own way, picking his steps and walking clean.

"Selecting for his particular attention as an investigator the structure of the temporal bone, in which lies the organ of hearing, and particularly that part of the bone known as the mastoid process, he emulated Browning's Grammarian in devoting a lifetime to this one small corner, and was rewarded by a discovery that revolutionised ideas regarding septic infection of the ear and its neighbourhood. Largely as a consequence of his teaching, modern operations on the mastoid, of which everyone has heard nowadays, rest upon a firm basis of anatomical fact. The hours and days and years that Cheatle spent over this single laborious task no one can number; but his monument is erected for all time in the rich collection of his specimens in the Museum of the Royal College of Surgeons in Lincoln's Inn-fields, as well as in the more accurate knowledge of the behaviour of the common purulent disease of the middle ear which he has bequeathed to medicine and to mankind. He was a patient worker, and a cautious theoriser, and, as he was but poorly gifted with expository powers—writing with much difficulty and speaking in public with even greater difficulty—his new teaching was long in making headway even here in England, while abroad his friends were often annoyed—as he was himself, for that matter—to find his discoveries and views, many years after their appearance, given the paternity of some French or German investigator who had apparently never heard his name."

Professional recognition of Cheatle's position was as wide as well merited. He gained the Adam Politzer Prize at the Ninth International Otological Congress, was an honorary member of several foreign otological societies, was a late president of the Otological Section of the Royal Society of Medicine, and in 1913 was president of the Section of Otology at the International Congress of Medicine. When the war broke out he was a member of the medical board of the Royal Air Force, with the rank of lieut.-colonel, and was also hon. consultant in his specialty to many of the military hospitals in the London and Eastern Commands, and was appointed aural surgeon to King Edward VII. and King George Hospitals.

Cheatle's literary work, though not voluminous, was all valuable, and proves his life-long interest in his subjects. Twenty-five years ago he wrote on sight and hearing in childhood with the late Brudenell Carter. He made a report on the examination of the ears and throats of 1000 school-children for public use; he wrote on gun deafness and its prevention: and the Hunterian Lectures at the Royal College of Surgeons of England on the "Surgical Anatomy of the Temporal Bone from Birth to Adult Life," were published in 1907 as a volume. These lectures contained a thorough, detailed and accurate description of the temporal bone both from the anatomical and surgical standpoint, the three most instructive chapters in the book setting out the relation of the lateral sinuses to the surfaces, the consistence of the outer antral wall and mastoid process, and the variations in the middle ear and antrum. The excellent illustrations made the book welcome as much to the anatomist as to the surgeon.

To "D. M.," also, we owe the following picture of the private side of Cheatle's life:—

"To those," he writes, "who knew the inner tragedy of Cheatle's life, a poignant loss by death in his early manhood, his devotion to work looked like a way of escape from tormenting memories, the reaction of a lofty mind to a sorrow ineffaceable, inexpressible. It was, indeed, in the circumstances, a salutary refuge, for Cheatle's was a proud and lonely nature, shy and slow to make men friends, though warm, responsive, and even playful with those who knew how to reach to the sensitive soul that hid behind the veil of his aloofness. When to this we can add that he was a man of fine presence, tall, straight, with clean-cut features and speaking eyes, we may succeed in conveying some faint outline of the impression his singular personality made upon those who knew and admired him for what he was no less than for what he did."

Sir Arnold Lawson writes:—

"Arthur Cheatle was one of my oldest friends. We were schoolboys together and nobody, more than myself,

knows his sterling worth both as a man and as a surgeon. I think, as a man, he was not easy to know well, but once he was a friend, he was a real friend and one of the most lovable of friends. He had, behind his natural shyness, a very warm heart and an intensely attractive personality, full of fun, and blessed with a most captivating smile and laugh, which endeared him to all who knew him. His courage through a long and tedious illness, which he well knew was a hopeless one, was marvellous. He never complained of the bitter stroke of fortune, which crippled him when he was at the zenith of his reputation, and he was always cheery and bright when his friends went to see him. What he really suffered he kept to himself; but he gave his friends a wonderful example of patient fortitude. As a surgeon in his own specialty I will say little, for everybody knows his splendid reputation, won by sheer, hard, thoughtful work. It was, indeed, primarily to overwork, when the time he could give to research was limited and interrupted by the demands of a very large and ever-growing private practice, that the breakdown in his health was due. English surgery has lost a great surgeon in Arthur Cheatle, and his work will live for ever in the history of otology."

IDA MARGARET GUILLAUME, L.R.C.P. EDIN.

Miss Guillaume, who died at Wakefield on May 19th, was the daughter of the late Thomas Guillaume. She studied medicine at the London School of Medicine for Women, at King's College Hospital, and in Dublin, and qualified with the Scottish triple diploma in 1904. For five years she held the post of medical officer and public vaccinator in the remote island of Shapinsay in the Orkneys. This work she left in favour of a long series of appointments at hospitals in England, including over four years as house surgeon at the Clayton Hospital, Wakefield, and two and a half years at the Whitehaven and West Cumberland Infirmary. Most of the war period she spent as senior resident medical officer at the Barry-road Military Hospital, Northampton, and after the war she went out to the West Indies to take up work as anæsthetist and resident medical officer at the General Hospital, Barbados.

SCOTTISH PRISONS IN 1928.

THE annual report of the Prison Commissioners for Scotland for the year 1928 (Cmd. 3309, price 2*s.*) shows little to be amiss with the health of the prisoners. The death-rate was low; no outbreak of disease was attributable to prison conditions; often the physical state of the inmates improved noticeably during their period of detention. The separate information from the medical officers of Scottish prisons confirms the satisfactory account, but it is summarised so formally that the reader looks in vain for the independent comments and suggestions which he is accustomed to find in the corresponding reports from English prisons.

Mental Disease and Defect.

He will wonder, for example, whether no difficulty is felt in Scotland as the result of limiting the statutory definition of mental defectives by inserting the words "from birth or from an early age." These words were so repeatedly criticised by the Prison Commissioners' reports for England and Wales that they were deleted in the revised definitions provided by the amending English Act of 1927. English prison officers had pointed out that, for lack of proof of the early mental history of many defectives, persons who should be segregated in institutions for special mental treatment were finding their way instead into prisons where their presence hampered the careful administration of education and reformative discipline. Lord Polwarth and his fellow Commissioners draw no special attention to this difficulty, which can hardly be unknown in Scotland. They are perhaps on the fringe of this topic at one point where they give a comparative table of the number of prisoners annually dealt with since 1920 for insanity and mental defect. There were 108 of such prisoners in 1928, including 89 insane, 18 feeble-minded, and 1 mental defective. The mental defective was sent to the State institution at Perth on the certificate of two medical practitioners under Section 10 of the Mental Deficiency and Lunacy (Scotland) Act of 1913. The 18 feeble-minded were, if their condition demanded it, reported to the inspectors of poor on discharge as requiring care and supervision. The 89 insane formed a more difficult problem. Insanity was deemed to have commenced in 15 cases after their admission to prison; in the remaining 74 cases it evidently existed before their admission; 69 of these were reported insane before they had been tried. If these latter cases had been charged with some grave crime or offence, they would presumably have been brought before a court and committed to detention (like criminal lunatics in England) for the period of His Majesty's pleasure. The charges against them not being serious, this method of disposal was not adopted. In view of the increasing number of such cases the Commissioner's report questions whether they should be sent to prison at all. "In cases other than those of serious criminal acts, where the mental condition of the person charged is suspected to be unsound, it seems desirable that he should be put under observation in a place other than a prison, if possible, unless there are special reasons against this course being followed." Dr. J. S. Edwards, medical superintendent of the Lunatic Department of Perth Prison, ends his brief report with a sentence which we should like to have seen more fully elaborated: "the association of inmates certified under the Mental Deficiency Act with inmates of the Lunatic Department has been successful and has given rise to no complaint; it is strongly recommended that this procedure should be continued meantime."

Diminishing Prison Population.

At the beginning of the month of April now past the body which had for almost half a century been known as the Prison Commissioners for Scotland became (as did the Scottish Boards of Health and Agriculture on Jan. 1st) a "Department" by virtue of the Reorganisation of Offices (Scotland) Act passed last year. The changes visible in 50 years of progress are many. Scottish prison administration, instead of being almost entirely local, has become central. The Borstal system has established itself and the placing of offenders on probation is now a common feature of justice even if Scotland has not yet got the staff of paid probation officers which became possible in England after the Criminal Justice Act of 1925. Among other changes in the law the abolition of sentences of three days' imprisonment, the arrangements for part payment of fines and the allowing of time for paying fines have all had their effect as the figures show. Fifty years ago there were 982 persons imprisoned in Scotland on civil grounds; last year there were only 58. Fifty years ago the total of criminal prisoners was 48,107; last year, in spite of the increase of population and the multiplication of statutory offences since 1878, there were only 16,314, the drop in the total of female prisoners from 17,534 to 3462 being particularly notable. The recent report actually records a shortage of convict labour for work on the Peterhead Harbour of Refuge. How far the figures may be still further reduced is a matter of interesting speculation. Better trade and steadier employment should have a marked effect. Unemployment, at any rate, is a not uncommon cause of moral failure in the brief autobiographies of 30 male prisoners printed in a final appendix to the report.

AN INDUSTRIAL CONVALESCENT HOME.—The Dunlop Tyre Co. has purchased a convalescent home for its employees at Rhos-on-Sea. There will be 30 beds.

MEDICAL CANDIDATES FOR PARLIAMENT.

NOMINATIONS were completed on May 20th, and one medical man has been returned unopposed to the House of Commons—namely, Prof. Thomas Sinclair, who represents Queen's University, Belfast, in the Conservative interest. Prof. Sinclair was returned unopposed for the same constituency at the General Elections in 1923 and 1924. The Scottish Universities constituency, with three members, is being contested by Sir George Berry in the Conservative, and Dr. J. Kerr in the Labour interest. The single seat for London University has three aspirants, this time only one of them a medical man—namely, Dr. E. Graham Little, who is again standing as an Independent. Medical men are opposing each other in two single-seat constituencies. Dr. Brook and Dr. Summerskill are both contesting Balham and Tooting against Sir A. Butt, the late member; in the Withington division of Manchester, Sir Thomas Watts will have to hold his own against Dr. Robinson as well as his old opponent, Mr. E. D. Simon, the champion of cheap housing.

Polling takes place next Thursday, May 30th, when the following 36 medical candidates will submit themselves for election: 12 as Conservatives, 6 as Liberals, 16 as Labour, and 2 under other designations. Those who sat in the last Parliament are indicated by a dagger sign, those who stood unsuccessfully by an asterisk.

Candidate.	Constituency.	Party.
*Right Hon. C. Addison	Swindon	Lab.
*Dr. Ethel Bentham	Islington (East)	Lab.
†Sir George Berry	Scottish Universities	C.
Dr. C. W. Brook	Wandsworth (Balham and Tooting)	Lab.
*Dr. F. G. Bushnell	Birmingham (Moseley)	Lab.
*Dr. Stella Churchill	Brentford and Chiswick	Lab.
Dr. J. D. Cooke	Camberwell (Peckham)	C.
*Dr. R. C. Cooke-Taylor	Camberwell (Dulwich)	L.
†Dr. A. Vernon Davies	Royton	C.
*Dr. R. Dunstan	Bethnal Green (S.W.)	Com.
†Dr. Walter E. Elliot	Glasgow (Kelvingrove)	C.
Dr. R. Forgan	Renfrew (West)	Lab.
†Dr. F. E. Fremantle	Hertford (St. Albans)	C.
†Dr. L. Haden Guest	Salford (North)	C.
†Mr. H. C. Haslam	Lincolnshire (Horncastle)	C.
*Mr. Somerville Hastings	Reading	Lab.
Dr. A. B. Howitt	Preston	C.
Dr. J. Hunter	Dumfriesshire	L.
†Sir Henry Jackson	Wandsworth (Central)	C.
Dr. J. Kerr	Scottish Universities	Lab.
Dr. J. W. Leech	Newcastle-on-Tyne (West)	C.
†Dr. E. Graham Little	University of London	Ind.
†Sir Richard Luce	Derby	C.
Dr. R. Lyons	Middlesex (Hendon)	Lab.
Dr. R. A. Lyster	Hampshire (Winchester)	Lab.
*Dr. R. O. Moon	Oxford	L.
*Dr. H. B. Morgan	Camberwell (North-West)	Lab.
Dr. J. H. Morris-Jones	Denbigh (Denbigh)	L.
Dr. Joseph Robinson	Manchester (Withington)	Lab.
†Dr. Alfred Salter	Bermondsey (West)	Lab.
Dr. J. V. Shaw	Derbyshire (Ilkeston)	L.
†Dr. Drummond Shiels	Edinburgh (East)	Lab.
*Dr. G. E. Spero	Fulham (West)	Lab.
Dr. W. H. Summerskill	Wandsworth (Balham and Tooting)	L.
†Sir Thomas Watts	Manchester (Withington)	C.
†Dr. J. H. Williams	Carmarthen (Llanelly)	Lab.

C. Conservative. L. Liberal. Lab. Labour.
Ind. Independent. Com. Communist.

Some Further Personal Records.

F. G. BUSHNELL, M.D. Lond., D.P.H., who contested the University of London seat in 1924 in the Labour interest and is now the officially adopted candidate of the Labour Party in the Moseley division of Birmingham, qualified in 1890, and has held public health appointments in Essex and Plymouth. He stands without reservation for spiritual, political, and economic relations with other nations and for a treaty of disarmament. As a socialist and Christian he asks that the policies of the State and the lives of its members should be founded on Christianity. As a member of the public health and hospital services he demands greater national endeavours to prevent and treat disease and to abolish its root causes. Especially he advocates day nurseries in congested areas, open-air schools, child-welfare centres with treatment and feeding where required, and the separation of contact children from infective tuberculosis in the home.

WALTER ELLIOT, *M.C.*, M.B. Glasg., who has been adopted as Conservative candidate for the Kelvingrove division of Glasgow, was Parliamentary Under Secretary of State for Scotland in the recent House of Commons, and, until he held office, acted as hon. secretary to the Parliamentary Medical Committee.

R. A. LYSTER, M.B. Birm., B.Sc. Lond., who is contesting the Winchester division of Hants in the Labour interest, is medical officer of health for the County of Hants, and late President of the Society of Medical Officers of Health. In his election address he bases his claim on having lived and worked continously in the division for 21 years and on his wide experience and powers of administration. He holds strong views on housing scandals, the neglect of unemployment, the defects of schemes of medical treatment and insurance, and of existing school buildings.

ROBERT LYONS, M.B. R.U.I., who is standing as Labour condidate for Hendon, is an assistant medical officer to the London County Council, having qualified in the year 1890. In his candidature he is laying particular stress on unemployment, peace, housing, and the improvement and extension of the health services.

Medical News.

UNIVERSITY OF LONDON.—The Faculty of Medicine has elected Lord Dawson, Mr. H. L. Eason, and Sir Cuthbert Wallace to represent the Faculty on the newly constituted Senate.

At a meeting of the Senate on May 15th, the Dunn exhibitions in anatomy and physiology for 1929 were awarded respectively to Mr. Woolf Mushin, of the London Hospital Medical College, and Mr. Barton Gilbert, of St. Thomas's Hospital Medical School.

The Principal's Report.—Mr. T. Franklin Sibly's report on the work of the University during the year 1928–29 has been issued. The total admissions by all channels amounted to 9708, being 600 more than last year. The total number of candidates for all examinations was 34,941, an increase of 1000 over last year, of which 15,186 were successful. The weeding out evidently takes place at an early stage, since of 4818 candidates for degrees or diplomas and certificates, 3089 satisfied the examiners. It is interesting to note the increased proportion of internal students. In the last year before the war there were more external than internal candidates for degrees (907 to 900); this year the external candidates numbered 1534, against 2357 internal ones. Benefactions of medical interest include a scholarship for training in physiology and biochemistry, raised by the committee of the Bayliss-Starling Memorial Fund. Mr. Geoffrey Duveen has made good a deficit in connexion with the travelling studentship which bears his name. The trustees of the late Mr. Charles Heath Clark have given £10,000 to found a lectureship in the history and progress of preventive medicine and tropical hygiene. £1,000 granted to the Medical Faculty of the University from the sum given by Lord Beaverbrook for medical education is being applied to the purposes of the Thomas Smythe Hughes Medical Research Fund. At the medical schools new professors have been appointed in the persons of Dr. S. J. Cowell (dietetics), Dr. R. Donaldson and Prof. G. Hadfield (pathology), Dr. G. W. de P. Nicholson (morbid anatomy), Dr. A. Leitch (experimental pathology), Dr. A. Fleming (bacteriology), Dr. H. Raistrick (biochemistry). New readers are Dr. S. L. Baker (morbid anatomy), Dr. H. D. Wright (bacteriology), and Mr. C. R. Harington (pathological chemistry). Arising out of the gift of £200,000 for building and equipment from Mr. Eastman, of New York, the Senate have informed the authorities of the London School of Medicine for Women that they approved in principle of the establishment of a Dental School and of a whole-time Chair of Dentistry (Orthodontics). A Ph.D. degree in non-clinical subjects in the Faculty of Medicine has been instituted, and for internal students, academic diplomas in clinical pathology and in public health. The Principal in all sections of his report draws attention to the increasing scope and development of the University which

is now in a stage of transition. The new statutes have now come into force, and the allocation of accommodation on the new site in Bloomsbury is now exercising the attention of a committee under the chairmanship of Sir William Beveridge. Provision has already been made for the inclusion of an administrative block, a library, a great hall, and of adequate housing for the Union Society.

University College.—The examination for the Bucknill Scholarship of 100 guineas and for two exhibitions of 55 guineas each will begin on June 25th. The subjects of the examination are chemistry, physics, botany, and zoology. Entry forms should be obtained from the Secretary of the College not later than June 1st.

UNIVERSITY OF MANCHESTER.—On May 15th the honorary degree of doctor of science was conferred on Sir Ronald Ross, F.R.S.

Dr. Louis Savatard has been appointed assistant lecturer in dermatology.

The new Robert Angus Smith scholarship of £150 for research in sanitary science is offered for competition. Particulars may be had from the registrar of the University.

In connexion with the meeting of the British Medical Association at Manchester in July, the honorary degree of doctor of laws will be conferred on Lord Dawson, and on Drs. W. J. and C. H. Mayo, of Rochester, U.S.A., and the honorary degree of doctor of science on Sir Ewen Maclean, president of the Association, and Dr. C. O. Hawthorne, chairman of the representative body.

ROYAL COLLEGE OF SURGEONS OF EDINBURGH.—At a meeting of the College on May 15th, with Mr. Alexander Miles, the President, in the chair, the following 30 successful candidates out of 85 entered, who passed the requisite examinations between Jan. 3rd and 12th, were admitted Fellows:—

Herbert Abernethy, Robert Erwin Austin, Harold Shaw Bilcliff, Bernard Brooks Blomfield, Donald Cameron Bowie, Rangachari Padmanabha Chari, William Noble Chisholm, Johannes Gerhardus Albertus Davel, Glyn Alexander Davies, Harry Geoffrey Estcourt, John Langwell Farquharson, Donald John Davidson Henderson, Richard Anthony Highmoor, Albert Edward King, Mangalore Copal Kini, Eric Roy Lange, Charles Gordon Lewis, Alan John Grange Mackay, Vasudeo Shankar Schoholkar, Samuel Newson, William James Pannell, Lindsay Morgan Park, Lawrence Vernon Pearson, Lindsay Sangster Rogers, Madan Copal Saincher, Christopher George Schurr, Bam Narain Sewal, Graeme Gibson Talbot, James Reid Wheeler, and George Wood.

The Bathgate Memorial Prize, consisting of bronze medal and set of books, after a competitive examination in Materia Medica, was awarded to Mr. Wai Ming Tso.

The following candidates, having passed the requisite examinations, received the higher Dental Diploma:—

Cyril Grosvenor, H. D. Kendrick, and G. E. Morgan.

ROYAL MEDICAL BENEVOLENT FUND.—At a recent meeting of the committee 51 grants were made amounting to £1204. This is the largest sum of money voted in any one month since the Fund was founded. The committee also elected five beneficiaries to Alexander Lawrence Annuities, the annuities being £70, £65, £60, £60, and £52. The following are short notes on five of the cases helped by grants:—

Widow, aged 50, of M.R.C.S. On the death of her husband in June, 1928, was left with an income of £50 a year and two daughters to educate. Her husband had served throughout the war and during service began a disease which undermined his health and which led to his death at the age of 51. The Officers Association will contribute £30 yearly towards the school fees of one child, and the Fund has voted £40 for the school fees of the other. The widow is trying to augment her income by taking paying guests.

M.R.C.S., aged 60, is suffering from paralysis. His wife and child of 5 is dependent on him. Private income £128 a year. Voted £40.

Daughter of L.K.Q.C.P., aged 61, has supported herself through life as governess and companion. Of late years she nursed and kept house for a delicate married sister who has now died and she is left dependent on her brother-in-law who is suffering from advanced tuberculosis. Voted emergency grant of £10 and £26 in four instalments. R.U.K.B.A. and R.A.M.C. fund will also cooperate and help this case, which is one of complete destitution.

Widow of L.R.C.P., aged 72, on death of her husband was left with an income of £67 a year. Voted £36.

Widow of M.R.C.S., aged 80, is a feeble old lady and in very straitened circumstances. Since the death of her husband in 1912 she has had to gradually use up her capital. She has now sold her last security which has realised £220; she has only this left to live on. Voted £36.

Subscriptions and donations should be sent to the hon. treasurer, Royal Medical Benevolent Fund, 11, Chandos-street, Cavendish-square, W. 1.

WALSALL HOSPITAL.—It has been decided to appoint an honorary consultant surgeon and an honorary consultant physician for general work, and two junior assistant surgeons are to be added to the staff to provide opportunities for the younger medical men in the area.

PAY BEDS AT ACTON.—The Council of Acton Hospital, W., have arranged to accept patients in private wards at a charge of £4 4*s.* weekly; a semi-private ward will cost £3 13*s.* 6*d.* These patients may be attended by their own doctors, with whom they will arrange operation fees; £1 1*s.* will be charged for the use of the theatre, radiographs, pathological tests, &c.

ENLARGEMENT OF ADDENBROOKE'S HOSPITAL.—The sum of £90,000 is required for enlargement of Addenbrooke's Hospital, Cambridge, and at the launching of an appeal on May 11th Mr. C. R. W. Adeane, the President, was able to announce that £16,000 had already been received. This includes donations of £2000 each from Mr. G. R. C. Foster and Miss A. Peckover, and £1000 from Mr. Arthur Cooke, senior surgeon of the hospital. The new plans for extension provide for a block of three storeys on the north side, facing the out-patient department, and this block will contain a children's ward and beds for 26 paying patients. An additional surgical ward for women is also to be constructed, and 29 extra bedrooms will be available for the nursing staff. Certain older parts of the hospital will be reconstructed, and the total number of beds gained will be 92.

WORK OF CHILDREN'S HOSPITALS IN LONDON.—In presiding last week at the annual meeting of the Queen's Hospital for Children, Hackney-road, the Duke of York stated that this institution deals with a larger number of children than any hospital of the kind. Last year there were 1818 in-patients and 32,708 out-patients. It was reported that the increased efficiency of the public health services had, during the last three years, reduced the number of out-patients.—The annual report of the Paddington Green Children's Hospital shows that the average cost of the 835 in-patients was £7 16*s.* 7*d.*, and that contributions from parents amounted to £1017. The Extension Building Fund now reaches something over £6000 towards the £50,000 required, £958 of which was produced by a wireless appeal.—The Infants Hospital in Vincent-square, Westminster, last year treated 748 in-patients, an increase of nearly 100; the out-patients numbered 15,551, an increase of more than 4000.

Medical Diary.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MONDAY, May 27th.—8 P.M., ODONTOLOGY (at the Royal College of Surgeons, Lincoln's Inn-fields, W.C.). Election of Officers and Council. Sir Frank Colyer will give a short description of the work carried out in the Museum during the past year.

TUESDAY.—5 P.M., MEDICINE. Election of Officers and Council. 5.30 P.M., General Meeting of Fellows. Ballot for election to the Fellowship.

THURSDAY.—7 P.M., ELECTRO-THERAPEUTICS. Election of Officers and Council at the Langham Hotel, Portland-place, W.

MEDICAL SOCIETY FOR THE STUDY OF VENEREAL DISEASES, 11, Chandos-street, Cavendish-square, W.

FRIDAY, May 31st.—8.30 P.M. General Meeting. Paper by Col. L. W. Harrison: Review of Experimental Work in Syphilis and its Possible Bearing on Man. A discussion will follow.

SOCIETY FOR CONSTRUCTIVE BIRTH CONTROL.

THURSDAY, May 30th.—8 P.M. (at Essex Hall, Strand, W.C.). Dr. Mather Thomson: The Sterilisation of the Unfit.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

NORTH-EAST LONDON POST-GRADUATE COLLEGE. Prince of Wales's General Hospital, Tottenham, N.

MONDAY, May 27th.—2.30 to 5 P.M., Medical Surgical, and Gynæcological Clinics. Operations.

TUESDAY.—2.30 to 5 P.M., Medical, Surgical, Ear, Nose and Throat Clinics. Operations.

WEDNESDAY.—2.30 to 5 P.M., Medical, Skin, and Eye Clinics. Operations.

THURSDAY.—11.30 A.M., Dental Clinics. 2.30 to 5 P.M., Medical, Surgical, Nose, Throat and Ear Clinics. Operations.

FRIDAY.—10.30 A.M., Throat, Nose and Ear Clinics. 2.30 to 5 P.M., Surgical, Medical, and Children's Diseases Clinics. Operations.

NATIONAL HOSPITAL, Queen-square, Bloomsbury, W.C.

MONDAY, May 27th.—2 P.M., Dr. Riddoch: Out-patient Clinic. 3.30 P.M., Mr. Leslie Paton: Papilloedema (1).

TUESDAY.—2 P.M., Dr. Walshe: Out-patient Clinic. 3.30 P.M., Dr. Critchley: Pick's Disease (Cortical Sclerosis).

THURSDAY.—2 P.M., Dr. Kinnier Wilson: Out-patient Clinic. 3.30 P.M., Dr. Gordon Holmes: Lesions involving the Optic Chiasma (1).

FRIDAY.—2 P.M., Dr. Adie: Out-patient Clinic. 3.30 P.M., Dr. Symonds: Neurosyphilis (2).

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, 49, Leicester-square, W.C.
MONDAY, May 27th.—5 P.M., Dr. J. A. Drake: Streptococcal Infections of the Skin.
TUESDAY.—Dr. W. N. Goldsmith: The Nervous System in relation to Skin Diseases.
THURSDAY.—Dr. W. J. O'Donovan: Skin Diseases of Animals Transmissible to Man.
FRIDAY, Dr. W. Griffiths: Bullous Eruptions.

UNIVERSITY COLLEGE, Gower-street, London.
TUESDAY, May 28th and the following WEDNESDAY and FRIDAY.—5.30 P.M., Prof. A. Brachet: Experimental Embryology.
WEDNESDAY and FRIDAY.—5.30 P.M., Prof. E. D. Wiersma: The Psychology of Dementia (First of two public lectures).
THURSDAY, 5 P.M., Mr. R. J. Lythgoe: Special Sense Physiology. (Fifth of six lectures).

ST. THOMAS'S HOSPITAL, Albert Embankment, Westminster Bridge, S.E.
THURSDAY, May 30th.—5 P.M., Prof. S. J. Cowell: Dietetics. (Fifth of six lectures).

UNIVERSITY OF BIRMINGHAM.
THURSDAY, May 30th.—4 P.M. (in the Medical Lecture Theatre, Edmunds-street Building), Dr. H. Charles Cameron: Some Types of Septic Infection in the Newly-born. (Second Ingleby Lecture.)

UNIVERSITY OF SHEFFIELD POST-GRADUATE CLINICS.
TUESDAY, May 28th.—3.30 P.M., (at the Jessop Hospital), Mr. Stacey: Labour Complicated by Contraction of the Pelvis.
FRIDAY.—3.30 P.M., Mr. Finch: Prostatic Enlargement.

Appointments.

BELL, W., M.D., Ch.B. Edin., has been appointed Medical Referee under the Workmen's Compensation Act for Bradford, Keighley, Skipton and Settle County Courts.
MILLER, H., M.B., Ch.B. Edin., Hon. Surgeon to the Northern Infirmary, Inverness.
Westminster Hospital: RODGERS, T. S., L.R.C.P. Lond., M.R.C.S., and BICLENKY, D., L.R.C.P. Lond., M.R.C.S., Resident House Physicians. PRIEST, W. H. D., L.R.C.P. Lond., M.R.C.S., Resident House Surgeon.
Certifying Surgeons under the Factory and Workshop Acts: JAMES, W. E., L.R.C.P. Lond., M.R.C.S. (Rhayader, Radnor); and WALKER, W. A., M.B., Ch.B. Glasg. (Irlam, Lancaster).

Vacancies.

For further information refer to the advertisement columns.

Aberdeen City.—M.O.H. £1100.
Barking Urban District Council.—Asst. M.O. and Asst. School M.O. £500.
Birmingham, City Mental Hospital.—Jun. Asst. M.O. £350.
Birmingham, Dudley-road Hospital.—Jun. Asst. M.O. At rate of £200.
Birmingham and Midland Homœopathic Hospital and Dispensary. H.S. £150.
Blackburn and East Lancashire Royal Infirmary.—Fourth H.S. £130.
Blackpool, Victoria Hospital.—H.S. £120.
Brighton, New Sussex Hospital for Women and Children.—H.S. and H.P. Each £50.
Cancer Hospital, Fulham-road, S.W.—H.S. At rate of £100.
Cardiff Royal Infirmary.—H.S. Aural H.S. Also Cas. Surg. O. Each at rate of £50.
Carshalton, Surrey, Queen Mary's Hospital for Children.—Jun. Asst. M.O. £500.
Chester Royal Infirmary.—H.S. £120.
City of London Hospital for Diseases of the Heart, &c., Victoria Park, E.—H.P. At rate of £100. Also Laryngologist.
Coventry and Warwickshire Hospital.—Res. H.S. £125.
Derby County Borough.—Temp. Asst. M.O. At rate of £600.
Dover, Royal Victoria Hospital.—H.S. £180.
East Ham Memorial Hospital, Shrewsbury-road, E.—Res. M.O. Also Res. H.P. and Cas. O. At rate of £150 and £100 respectively.
Evelina Hospital for Children, Southwark, S.E.—H.P. At rate of £120.
General Lying-in Hospital, York-road, Lambeth, S.E.—Res. M.O. At rate of £100.
Gravesend and North Kent Hospital.—Jun. H.S. At rate of £80.
Grimsby County Borough and Port of.—Asst. M.O.H. £700.
Harrogate Infirmary.—Jun. H.S. £100.
Hertford County Hospital.—H.P. At rate of £150. Also Hon. Surg.
Hospital for Sick Children, Great Ormond-street, W.C.—H.S. and H.P. Each at rate of £100. Also Res. M.O. for Country Branch, Tadworth, Surrey. At rate of £250. Also Surg. Reg. £300.
Hull Royal Infirmary.—Cas. H.S. At rate of £130.
Kingston and District Hospital.—Third Asst. Res. M.O. At rate of £250.
Lancashire County Council.—Asst. County M.O. £800.
Leeds, St. James' Hospital.—H.P. and S. £200.
Leicestershire County Council.—Asst. County M.O.H. £650.
Liverpool Heart Hospital.—Maurice Stern Research Fellowship. £150.
London Homœopathic Hospital, Great Ormond-street and Queen-square, Bloomsbury, W.C.—Surgeon in Charge of the Orthopædic and Mechano-Therapy Department.
Lowestoft and North Suffolk Hospital.—H.S. £120.
Maidstone, West Kent General Hospital.—Radiologist.
Male Lock Hospital, 91, Dean-street, W.—H.S. At rate of £200.
Manchester, Ancoats Hospital.—Anæsthestist. 10*s.* 6*d.* per attendance. Also H.S. At rate of £100.
Manchester Northern Hospital for Women, &c.—Sen. H.S. Also Jun. H.S. At rate of £130 and £100 respectively.
Manchester Royal Eye Hospital.—Jun. H.S. £120.
Manor House Hospital, Golders Green, N.W.—Jun. H.S. At rate of £200.
Margate Royal Sea-Bathing Hospital.—Asst. Med. Supt. £500.
Middlesex County Council.—Asst. Dental Officer. £500.
Miller General Hospital, Greenwich-road, S.E.—Out-patient Officer. At rate of £150.
Montrose Royal Asylum.—Jun. Asst. M.O. £325.
Newcastle, London-road Institution.—Asst. M.O. £250.
Northampton General Hospital.—Hon. Anæsthetist.
Northampton Mental Hospital, Berrywood.—Locum Tenens M.O. 7 gns. a week.
Northamptonshire County Council.—Tuberculosis Officer. £750.
Nottingham, General Hospital.—Res. Cas. O. At rate of £200.
Preston, Biddulph Grange Orthopædic Hospital.—Jun. H.S. At rate of £150.
Preston, High Carley Sanatorium, near Ulverston.—Asst. Tuberculosis M.O. £450.
Queen Charlotte's Maternity Hospital, Marylebone-road, N.W.—Asst. Res. M.O. At rate of £80.
Queen Mary's Hospital for the East End, Stratford, E.—Res. M.O. £200. H.P. and Cas. O. £150. Also H.P., Two H.S.'s and Obstet. H.S. Each £120.
Queen's Hospital for Children, Hackney-road, E.—H.P. Also H.S. Each at rate of £100.
Rangoon, Harcourt Butler Institute of Public Health.—Director. 1650 Rupees a month.
Royal Free Hospital, Gray's Inn-road, W.C.—Asst. M.O. for V.D. Clinic. £500. H.P.'s and H.S.'s. Also Obstetric District Asst. £100. Cas. O. £150.
St. Peter's Hospital for Stone, Henrietta-street, Covent Garden, W.C. Clin. Assts.
Salop County Council.—Asst. M.O. £600.
Shrewsbury Eye, Ear and Throat Hospital.—H.S. £200.
South London Hospital for Women, South Side, Clapham Common, S.W.—Asst. Phys.
South Shields, Ingham Infirmary.—Sen. and Jun. H.S.'s. £200 and £150 respectively.
Stoke-on-Trent, North Staffordshire Royal Infirmary.—H.S. £150. H.S. for Ophthalmic and Aural Departments. £150. Also Asst. H.P. £125.
Sudan Government.—M.O. £E720.
Taunton and Somerset Hospital.—Sen. and Jun. House M.O.'s At rate of £150 and £100 respectively.
Wakefield, West Riding Mental Hospital.—Jun. Asst. M.O. £400.
Walsall General Hospital.—H.S. At rate of £150.
Walsall and West Bromwich Unions Joint Committee Institutions, Great Barr Park.—Res. M.O. £500.
Warrington Infirmary and Dispensary.—H.P. At rate of £150.
West London Hospital, Hammersmith-road, W.—H.P., H.S., Aural S., and Ophth. H.S. Each at rate of £100.
Western Australia.—M.O.H. £756 to £960.
Willesden General Hospital, N.W.—Registrars.
York County Hospital.—H.P. and H.S. Each £150.
Zetland, County of.—School Medical Officer, &c. £700.

The Home Secretary gives notice that in consequence of the resignation of one of the Medical Referees under the Workmen's Compensation Act, 1925, for the Districts of the Abergavenny and Blaenavon; Crickhowell; Monmouth; and Tredegar, Abertillery and Bargoed County Courts (Circuit No. 24), the appointment held by him is falling vacant. Applications for the post should be addressed to the Private Secretary, Home Office, Whitehall, S.W.1, and should reach him not later than 7th June, 1929.

Births, Marriages, and Deaths.

BIRTHS.

JACK.—On April 7th, at Rawalpindi, India, the wife of Lieut.-Colonel W. Morton Jack, O.B.E., I.M.S., of a daughter.
LONG.—On May 15th, at Dene End, Stormont-road, Highgate, N., the wife of Dr. Harold Long, of a son.

DEATHS.

ALEXANDER.—On May 14th, at Tigh Beg, Sutton, Archibald Spiers Alexander, M.D., aged 75 years.
GRAVES.—On May 10th, at Bucknell, Shropshire, Thomas William Graves, M.R.C.S., M.O.H., late of Knighton, Radnorshire.
GUILLAUME.—On May 19th, 1929, at a nursing home, Wakefield, after a serious operation, Ida Margaret Guillaume, L.R.C.P., L.R.C.S.E., L.F.P.S.G., L.M. (Rotunda), sometime Resident House Surgeon at the General Hospital, Barbados, and the Clayton Hospital, Wakefield, and elsewhere, beloved daughter of the late Mr. Thomas Guillaume and of Mrs. Ada Fanny Guillaume, of Umballa, Sandbanks.
POLLOCK.—On May 18th, at Maxwell-road, Northwood, Major-General C. E. Pollock, C.B., C.B.E., D.S.O., late K.H.S., and Deputy Director-General Army Medical Services.

*N.B.—A fee of 7*s.* 6*d.* is charged for the insertion of Notices of Births, Marriages, and Deaths.*

Notes, Comments, and Abstracts.

HOSPITAL APPEALS.

WHAT policy should the organisers of hospital appeals adopt? Faced with the rivalry of keen competitors, should they be humdrum or original? Should they invite the donations of the charitable by sober statement and a reasoned enlistment of normal human sympathy, or should they seek to touch some sentimental weakness or even exploit a superstitious fear? A daily newspaper lately announced the withdrawal of a hospital appeal at the instance of the Lord Mayor of London who, as president of the institution, had thought its terms improper. The circular, we are told, set out the needs of a well-known maternity hospital, its building commitments in anticipation of financial support, and the saving of life of mothers and babies if the extended facilities are provided. To stir the imagination, the circular enclosed a pin and asked that the pin be returned with a cheque attached. So far the appeal seems unobjectionable, but there was a figurative description of the pin as a magic pin and a hint that, if the pin were not returned, a mother's life or a baby's life might be lost. What was no doubt intended as a quite legitimate play of fancy was capable perhaps of misunderstanding. The superstitious might regard it as a potent spell; the sceptical might look on it as a mere nuisance, not unlike those "chain of prayer" appeals whereby recipients were warned that to break the chain would involve liability to untold evils. And so the circular was withdrawn and the hospital organisers are left to find some new ingenuity of address. The decision to withdraw the appeal was solely a matter for the hospital concerned; if withdrawal was deemed advisable, no outside comment is necessary. Other institutions will note the incident. Our hospitals are dependent upon the generous support of the charitable public. A fancied indiscretion by one mendicant may check the public sympathy towards others.

THE COMPANIONATE MARRIAGE.

FOR the last 25 years Benjamin Barr Lindsey has been a Court Judge at Denver, Colorado. In this capacity he has seen the breakdown of the marriages of thousands of couples, and has set forth the conclusions drawn from this experience in book form.[1] In a preface we are informed that "companionate" marriage differs from "trial" marriage. But the difference is one of psychological emphasis rather than of form. A companionate marriage is typically one entered into by young people, and is distinguished from ordinary marriage by the fact that the couple take contraceptive measures to avoid children, and are given facilities for obtaining divorce in the event of their temperaments not proving compatible. They are thus spared having to resort to the hypocrisy and deception demanded by the existing legal procedure for divorce. The difference in psychological emphasis consists in this. The couple embarking upon companionate marriage intend that the marriage shall be a success, while those entering upon trial marriage envisage a divorce as soon as the flame of romantic passion has cooled. The book consists of a compilation of "case histories," presented in the form of racy anecdotes which contain much duologue between Judge Lindsey and others. These anecdotes make light reading. They fully bear out a generalisation made by Mrs. Bertrand Russell in an introduction, which runs as follows: "Roughly speaking, in England, you may say that you believe in almost any form of sexual freedom providing that you do not act according to your beliefs. In America, you may act as you please provided that you say that you do not believe in what you are doing."

It is by reason of its social effects rather than of its contents that this book deserves notice. It has enjoyed a very wide sale in America, and has there exerted a considerable influence. More than perhaps any other book, it has directed attention to the problem of contraceptive technique, which, it is being more and more realised, is an essentially medical problem. The amount of discussion which this book has provoked would suggest that, accompanying the prodigious mechanical changes which are visibly transforming the landscapes of America, there are now in operation social and ethical changes, less conspicuous but perhaps more profound, by which human relationships across the Atlantic are rapidly being transformed.

[1] The Companionate Marriage. By Judge Ben Lindsey and Wainwright Evans. London: Brentanos, Ltd. 1928. Pp. 396. Price 10s. 6d.

NEW PREPARATIONS.

Kharophen: Hypoloid Sodium Salicylate (Burroughs Wellcome and Co., Snow-hill Buildings, London).—Kharophen is an addition to the list of amœbicidal agents issued by this firm. It is an acetyl derivative of 3-amino-4-hydroxy-phenyl-arsinic acid, and clinical reports indicate that it is of real value in the treatment of amœbic dysentery. It is claimed to possess considerable advantages over other amœbicidal agents in that it is definitely tonic and non-depressant. It has been used effectively in the treatment of yaws, both in adults and in children. The preparation is put up in bottles of 25 tabloids, each containing grs. 4 (0·259 g.). The tablets are administered by the mouth, one tabloid twice a day for a course of ten days. *Hypoloid Sodium Salicylate* is a sclerosing solution for the treatment of varicose veins by injection. The preparation is issued in strengths of 20, 30, and 40 per cent., in hermetically sealed phials of 5 c.cm. ready for immediate intravenous injection in suitable cases, such as where the need for the astringing medium occurs in pregnancy or menstruation, where hypoloid quinine and urethane might be thought unsuitable.

Acidophilus Bacillus Blocks, M-A-B (H. K. Mulford, Co., Ltd., Regent Arcade House, 252, Regent-street, London, W.).—This is a new form of administering the acidophilus bacillus, which normally inhabits the human intestine, predominantly that of the infant and young child. In order to facilitate mass dosage over long periods, the blocks are put up in a concentrated mass culture of Lactobacillus acidophilus in a medium of agar jelly covered with a chocolate coating, the blocks measuring about $1 \times \frac{3}{4} \times \frac{1}{2}$ inches. These are encased in foil which, on removal, presents a sweet with the appearance and taste of a good chocolate confection. The tablets, which are known as M-A-B, are put up in boxes of one dozen, and form a portable and pleasant way of obtaining acidophilus treatment. Each block at the time of issue is said to contain some 150 billion bacilli of the Y type, the number usually present in a pint of comparable acidophilus milk. The recommended dose is from two to four blocks per day for an adult, eaten just before, or two to three hours after meals. For children the dose is half to two blocks daily according to age.

SLUMS IN MANCHESTER.

A BOOK[1] about housing conditions in Manchester, by one who has an intimate knowledge of municipal affairs in that city, will be of value to all individuals, committees, and local authorities who take a keen interest in the slum problem. Statements made at conferences, and even in the House of Commons, often reveal a curious ignorance of many of the factors bearing on the question. Public health officials will find but little matter that is new to them. Here and there even Mr. Simon has failed to understand some of the terms and methods employed in official reports. For instance, the "Registrar-General's standard" of overcrowding is wrongly described on p. 7, and the standard based on cubic capacity, which is really used to a far greater extent by local authorities, is disregarded. Mr. Simon's book would have been of greater value if he had taken cognisance of investigations of overcrowding which have been carried out in towns other than Manchester, sometimes on slightly different lines. The use in this book of the word "re-conditioning" would not be accepted by all those who are interested in this method of dealing with unfit houses. It is doubtful, indeed, if the term has done anything towards clarifying the situation, but if it is to be used, it should not be applied to operations which can more adequately be described by terms which have already obtained the sanction of usage through their embodiment in the wording of Acts of Parliament. Of Mr. Simon's solutions of the slum problem, that of reducing the rates on working-class houses, which are better than the slum houses, has certainly much in its favour, and is in line with an idea to which the public has become accustomed by recent legislation. The proposal to make an allowance on rent according to the number of children would, on the other hand, present many difficulties, and is not likely to meet with ready acceptance. Mr. Simon may care to note that there is no medical officer of health of Camlachie as such, the place being a district in a city which is even bigger than Manchester.

TIME OF DAY IN RELATION TO CONVULSIONS IN EPILEPSY.

OUR attention has been drawn to an error appearing in the paper on this subject by Dr. Mary Langdon-Down and Dr. Russell Brain published in our last issue. In the sixth line of the third paragraph on p. 1032, the words "between the hours of 8 A.M. and 2 P.M." should read "between the hours of 8 P.M. and 2 A.M."

[1] How to Abolish the Slums. By E. D. Simon, ex-Lord Mayor of Manchester. London: Longmans, Green and Co. 1929. Pp. 146. 4s.